

Missouri
Department
of Natural
Resources

St. Louis Region PrintSTEP

Plain Language Workbook



PrintSTEP Environmental Pilot Program

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Disclaimer Page

US Environmental Protection Agency Disclaimer

This document provides regulatory guidance to printers regarding wastewater, storm water, hazardous waste, and air requirements. It includes a summary of the regulatory requirements for these waste streams as well as PrintSTEP specific requirements. The document is not a substitute for EPA's regulations, nor is it a regulation itself. Thus, it cannot impose legally binding requirements on EPA, States, or the regulated community. The regulatory guidance was designed exclusively for use in the PrintSTEP pilots and may not be applied outside of the pilots. EPA may change this guidance in the future, as appropriate.

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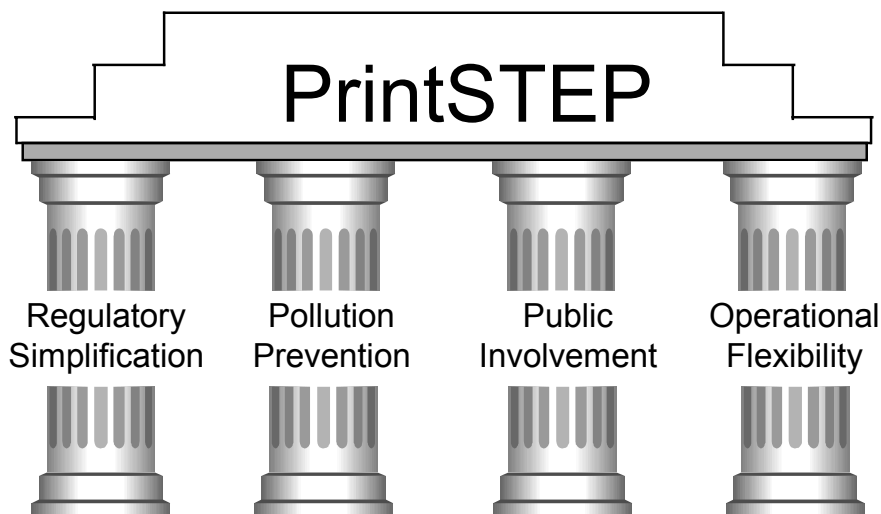
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Introduction to PrintSTEP

PrintSTEP, which stands for “**Printer’s Simplified Total Environmental Partnership**,” is a voluntary program being pilot tested in the St. Louis Region. PrintSTEP is a program that produces a single enforceable agreement between the printer and the Missouri Department of Natural Resources (MODNR) that covers your regulations for wastewater, hazardous waste, storm water, and air emissions. PrintSTEP does not change any of the existing environmental regulations, but it simplifies and consolidates these regulations so you can run your business in a way that is cleaner, cheaper, and smarter. The four “pillars” of PrintSTEP are described below:



- ☛ **PrintSTEP combines environmental requirements for printing facilities into one system, administered by one agency, all included in this *Workbook*.** Chances are, you currently need to deal with different kinds of environmental permits, paperwork, or approvals to conduct your business. Working with different agencies and different forms can be confusing and time-consuming. With PrintSTEP, your wastewater, hazardous waste, stormwater, and air requirements are all covered in one package. Our goal is to have one form to submit and one environmental agency to contact for permits and annual reports.

- ☛ **PrintSTEP promotes pollution prevention.** Pollution prevention means changing your processes to generate less pollution in the first place, instead of treating and disposing of it after it is created. This can save you money by using fewer resources and creating less waste. Through PrintSTEP, you will have access to free technical assistance to help you find ways to prevent pollution. PrintSTEP also encourages pollution prevention by highlighting how your regulatory requirements differ depending on your facility's overall releases. The less you release, the fewer the regulatory requirements.
- ☛ **PrintSTEP incorporates public participation.** Public participation provides an opportunity for regulatory agencies, the printer, and the community to educate each other on their concerns and interests. Under the current regulatory system, the public may not be aware of printers' contributions to their communities, or their efforts to be environmentally responsible neighbors.
- ☛ **PrintSTEP provides operational flexibility.** When you make a process change under PrintSTEP, in many cases, no notification is required. If the change does not result in a change in your current regulatory status, you can often make whatever changes are needed to respond to market demands without notifying the PrintSTEP contact.

PrintSTEP Pilot Eligibility

- ☛ Facilities where printing is the primary operation are eligible to participate in the PrintSTEP pilot program. Current local environmental authority (municipal, county or sewer district) permits and fees may be incorporated into the PrintSTEP Agreement.
- ☛ Facilities where printing is an ancillary operation may or may not be eligible for the PrintSTEP pilot program, depending on the nature of the primary industry.
- ☛ Facilities that operate printing presses, but "quick copies" are the primary product, may not be eligible for the PrintSTEP pilot program.
- ☛ If you have any questions about your eligibility, call your PrintSTEP Coordinator, Bill Hernlund, at the Missouri Department of Natural Resources St. Louis Regional Office at (314)-301-7682.

- ☛ Any facility being investigated for state or local environmental authority permit revocations or violations to the ordinances, laws or regulations will be postponed

from acceptance into the PrintSTEP program until the violation issues are resolved satisfactorily by all parties.

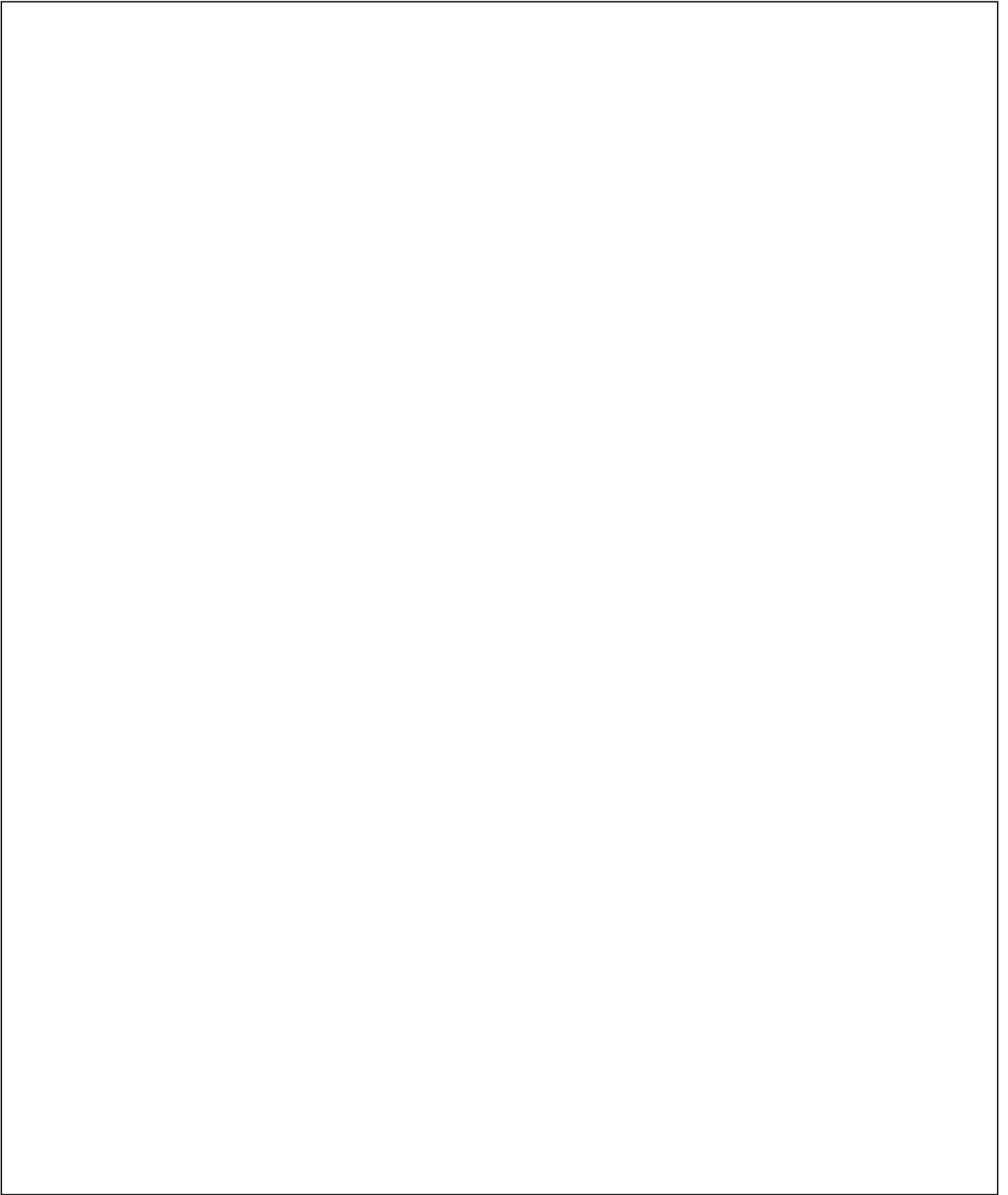
Stakeholder Advisory Group

The St. Louis PrintSTEP Stakeholder Advisory Group (SAG) provided guidance to the Missouri Department of Natural Resources (MODNR) on how to implement the PrintSTEP pilot program. By getting input from this diverse group, the PrintSTEP pilot program implements better representation to meet the needs of all interested parties.

The SAG includes representatives from the printing industry, environmental protection, communities and environmental justice organizations:

- American Lung Association of Eastern Missouri, environmental health
- Commercial Lithographing Company, technical advisor
- Conservation Federation of Missouri, environmental protection
- Fleming Printing Company, industrial representative
- Missouri Department of Natural Resources (MODNR), regulatory agency
- Printing Industries of St. Louis (PISTL), printing industry
- Rainbow Chamber of Commerce of Greater St. Louis, environmental justice
- United States Environmental Protection Agency (EPA), regulatory agency
- Wesley House Association, community and environmental justice

The MODNR will continue to work with the SAG throughout the development and completion of the PrintSTEP pilot project. The Advisory Group will assist the MODNR in finalizing the details for public participation in PrintSTEP and in finalizing the standard requirements for the printers' PrintSTEP Agreements.



USE THIS CHECKLIST AS YOU GO THROUGH THE WORKBOOK TO MAKE SURE YOU'VE COVERED EVERYTHING

- ✓ Check the Printer Eligibility Guidelines to find out if you qualify for PrintSTEP.
- ✓ Determine your environmental releases:
 - Where does your process wastewater go? *(check one)*
 - ☐ No process wastewater is generated
 - ☐ To the public sewer and I am not a Significant Industrial User (SIU)
 - ☐ To the public sewer and I am a Significant Industrial User
 - ☐ To surface water and I have an individual NPDES permit
 - What is your hazardous waste generator status? *(check one)*
 - ☐ No hazardous waste generation
 - ☐ I am a Conditionally Exempt Small Quantity Generator
 - ☐ I am a Small Quantity Generator
 - ☐ I am a Large Quantity Generator
 - What is your storm water status? *(check one)*
 - ☐ Exempt ☐ General NPDES permit
 - What is your Air Level? *(check one using the tables provided in Chapter 1)*
 - ☐ Level 1 ☐ Level 2 ☐ Level 3 ☐ Level 4 ☐ Level 5
- ✓ Determine your requirements for public participation:
 - No public participation requirements
 - “Limited” public participation requirements
 - “Full” public participation requirements
- ✓ Work with the Missouri Department of Natural Resources (MODNR) and community to address public comments, as needed.
- ✓ Read Chapter 4 of this Workbook to help you find pollution prevention opportunities.
- ✓ Submit your PrintSTEP application to the MODNR (the form is in Appendix D).
- ✓ **If your releases are low enough that you only have to submit a PrintSTEP Notification, then, congratulations, you're done! You just have to operate within the requirements set for Notifiers and maintain your Notifier status.**
- ✓ For printers who need a PrintSTEP Agreement from the MODNR, you have a few more steps:
 - Involve the public in the PrintSTEP application process.
 - Receive your final PrintSTEP Agreement from the MODNR.
 - Comply with the requirements of your PrintSTEP Agreement.

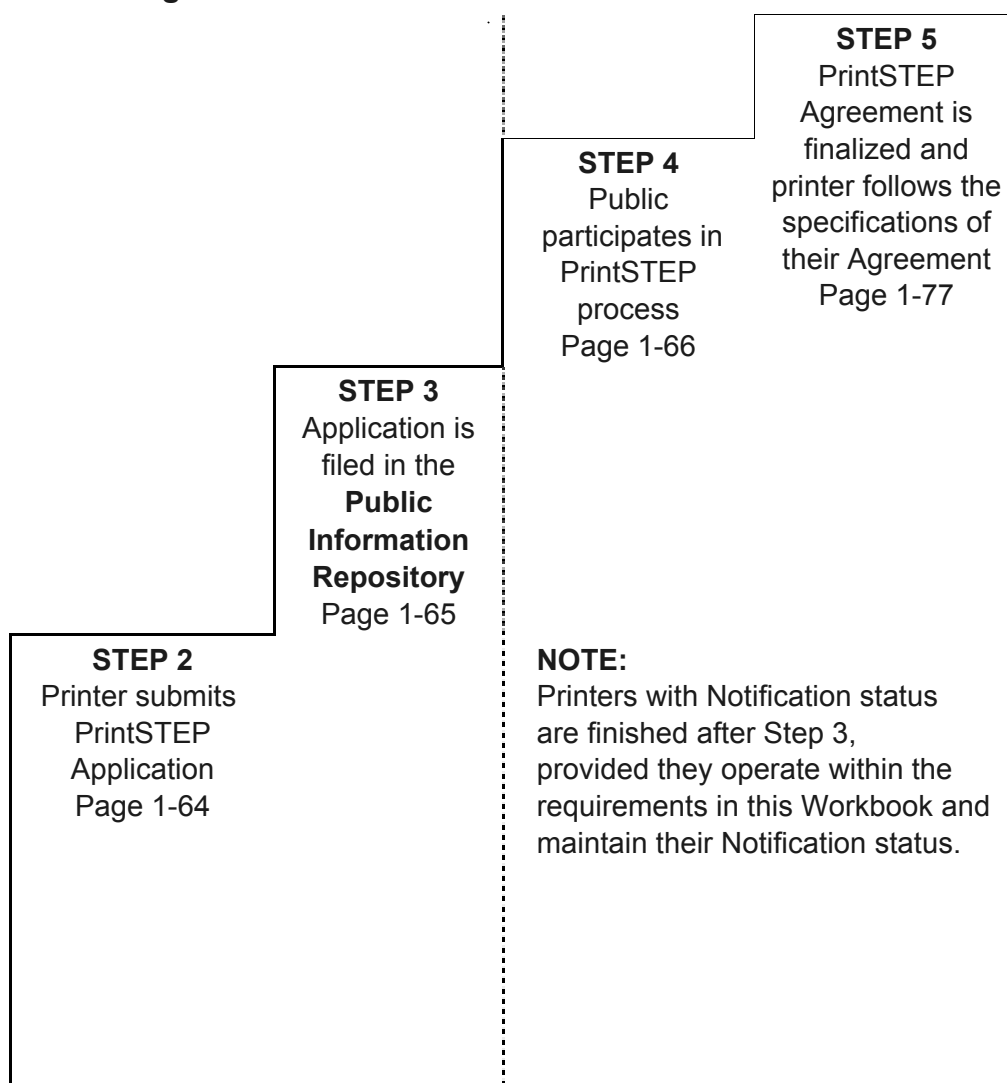
CHAPTER 1

How to Become a PrintSTEP Participant

To become a PrintSTEP printer, you must first complete your PrintSTEP Application. All the worksheets to prepare you for completing your Application are in this chapter. The Application itself is in Appendix D of this Workbook.

Figure 1 shows the basic process of participating in PrintSTEP. Printers who choose to participate will have their process wastewater, hazardous waste, storm water, and air requirements all covered under PrintSTEP. There is no need to fill out multiple forms or make calls to multiple agencies. Read on to become a PrintSTEP printer yourself!

Figure 1: The PrintSTEP Process



STEP 1

Printer determines
environmental
releases and waste
generated

Pages 1-4 to 1-63

In PrintSTEP, fewer releases mean fewer requirements

In PrintSTEP, your regulatory requirements depend on the quantity of emissions or wastes you generate. Fewer releases lead to fewer requirements. Those printers with the lower releases and wastes will send in a simple PrintSTEP Notification. Printers with greater releases will get a PrintSTEP Agreement, as described below.

EITHER- PRINTSTEP NOTIFICATION



- ✓ You discharge process wastewater to a public sewer and are not a Significant Industrial User (SIU), or you have no process wastewater discharge **AND**
- ✓ You do not generate hazardous waste or you're a Conditionally Exempt Small Quantity Generator or a Small Quantity Generator **AND**
- ✓ Your storm water is exempt from regulation **AND**
- ✓ Your air emissions qualify within Level 1 standards

- ☛ Printers with the lower levels of environmental releases or wastes submit a simpler PrintSTEP Notification.
- ☛ Document your environmental releases/wastes and submit a PrintSTEP Application for the Missouri Department of Natural Resources (MODNR) files in the **Public Information Repository** (see Step 3 on page 1-65).
- ☛ That's it! You are a PrintSTEP participant as long as you operate within the requirements and maintain your Notification status.

OR- PRINTSTEP AGREEMENT



- ✓ You discharge process wastewater to a public sewer and are an SIU, or require an individual General NPDES Permit **OR**
- ✓ You're a Large Quantity Generator of hazardous waste **OR**
- ✓ Your storm water is regulated **OR**
- ✓ Your air emissions are within Levels 2, 3, 4, or 5 standards

- ☛ Printers with greater environmental releases or wastes get a PrintSTEP Agreement, instead of a Notification.
- ☛ Document your environmental releases/wastes and submit a PrintSTEP Application, which the MODNR files in the **Public Information Repository** (see Step 3 on page 1-65).
- ☛ Work with the MODNR and community to address concerns and develop

the PrintSTEP Agreement, which will include your regulatory requirements for wastewater, hazardous waste, storm water, and air.

- ☛ When you receive your final PrintSTEP Agreement from the MODNR, you are a PrintSTEP participant as long as you operate within the requirements of your Agreement.

PrintSTEP Agreements are Comprehensive

PrintSTEP combines your requirements for process **wastewater**, **hazardous waste**, **storm water** and **air** emissions. Your regulatory requirements for each waste stream correspond to the magnitude of your releases related to each waste stream. The waste stream in the highest category determines whether you need a Notification or an Agreement, as shown in the example below.

An Example: ABC Printing Company

Waste Stream	Notification	Agreement
Wastewater: they discharge to a public sewer and are not a Significant Industrial User	✓	
Hazardous Waste: they are a large quantity generator		✓
Storm Water: they are exempt from storm water regulations	✓	
Air: very low air emissions (Level 1)	✓	

- ✓ Even though ABC Printing qualifies for Notification status based on 3 of the 4 waste streams, they still must apply for a PrintSTEP Agreement because of their hazardous waste. While the PrintSTEP Agreement will cover all 4 waste streams, it will list the same requirements as a Notifier would have for wastewater, storm water, and air.

NOTE:

- This Workbook describes the most significant regulations that typically apply to a printer's process wastewater, hazardous waste, storm water, and air emissions. However, be aware that the applicability of regulations depends on the particular processes and chemicals used in each facility. This Workbook was designed to cover the regulations for most printers, but there will always be exceptions.
- Please check with your county, city, sewer district and other local environmental agencies and/or any local permit conditions regarding other rules that may apply to your facility that may not be included in this Workbook.

STEP 1: DETERMINE YOUR ENVIRONMENTAL RELEASES

In STEP 1 you will:

- ✓ determine your environmental releases for process wastewater, hazardous waste, storm water, and air emissions;
- ✓ determine the corresponding regulatory categories;
- ✓ determine your corresponding regulatory requirements for each waste stream.

PrintSTEP Application forms may be found in Appendix D.

★TIP

Determine if any measures can be taken to reduce emissions.

Before submitting your PrintSTEP Application, you may want to see if you can reduce your environmental releases and wastes to ease your regulatory requirements. Pollution prevention is the preferred method for doing this (see Chapter 4).

★TIP

Consider meeting with the community.

You may wish to give people a chance to learn about your business and to answer questions. This can help expedite the public participation process later on. Chapter 3 of this Workbook gives some ideas on how to work with your community.

★TIP

Free help!

*You can get assistance with pollution prevention opportunities or regulatory compliance questions through the Missouri Department of Natural Resources, Technical Assistance Program (TAP) representative in St. Louis at 314-340-5900 or the TAP representatives in Jefferson City at 800-361-4827. **The assistance is free**, so take advantage of it! For assistance with the PrintSTEP program, please call Bill Hernlund, the PrintSTEP Coordinator, at 314-301-7600.*

Step 1 for WASTEWATER



The **CLEAN WATER ACT** (CWA) regulates discharges of pollutants to waters in the U.S. The CWA makes it unlawful for any person or facility to discharge any pollutant directly into navigable waters unless a National Pollutant Discharge Elimination System (NPDES) permit is obtained from the Missouri Department of Natural Resources (MODNR). Most printers discharge their process wastewater to their local sewer system, like the Metropolitan St. Louis Sewer District (MSD), which, in turn, is treated in the local sewage treatment plant, also called a publicly owned treatment works (POTW). The local sewer authority sets requirements for wastewater discharge, and treats wastewater before discharging it to surface waters.

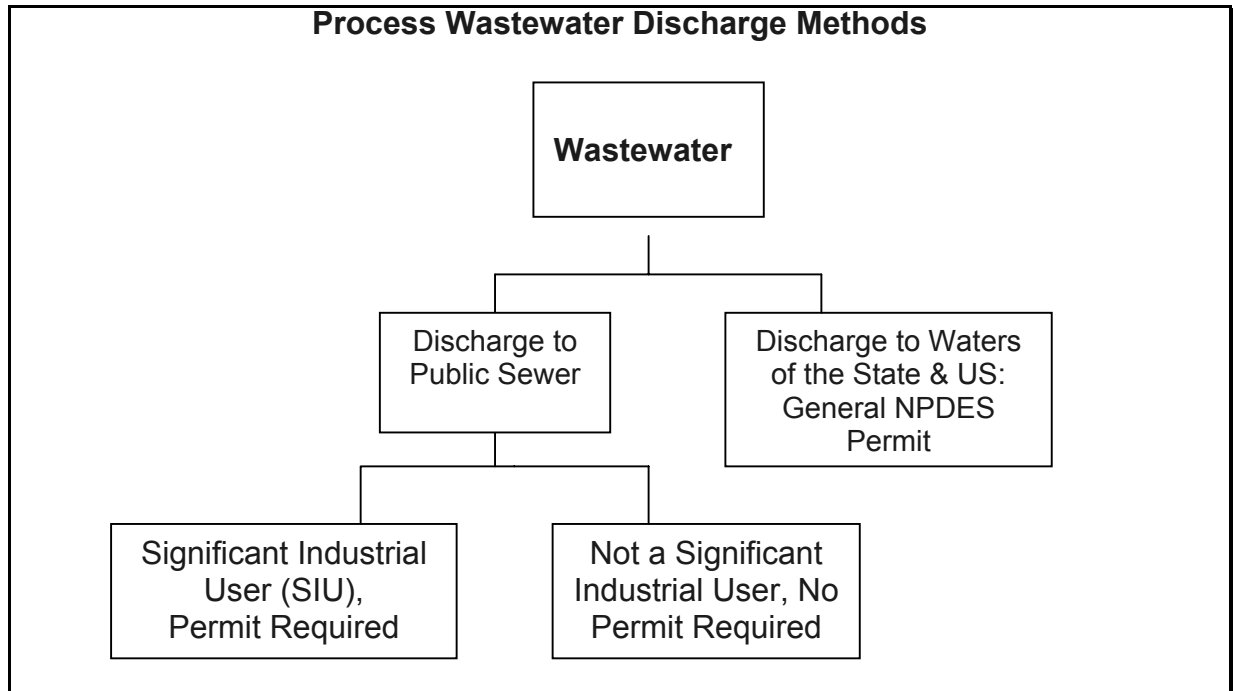
Do I need a permit?

Process wastewater may be discharged through one of two methods, as shown in the diagram on the next page. Wastewater may be discharged from a point source to the waters of the state (rivers, lakes, etc.). In this case, a **National Pollutant Discharge Elimination System** (NPDES) permit is required from the **Missouri Department of Natural Resources (MODNR) Water Pollution Control Program** (WPCP).

Alternatively, wastewater may be discharged to the local sanitary sewer, which is controlled by the local sewer authority, such as the **Metropolitan St. Louis Sewer District** (MSD). Facilities discharging to a public sewer, like MSD, may be designated as a **Significant Industrial User** (SIU) by the sewer authority. SIUs are subject to federal wastewater discharge standards if they discharge more than 25,000 gallons per day of process wastewater, contribute 5%-or-more of the hydraulic or organic capacity of the public sewer, or are considered to have the potential to adversely impact the public sewer. Facilities must receive state and/or local permits if the local sewer authority designates the facility as a SIU.

If a facility is discharging to a local sewer authority like MSD, but is not designated as an SIU, the local sewer authority will generally regulate the facility through a general permit. However, local sewer authority regulations impact ALL industrial users, and many of the regulations are applicable to the industrial user whether or not they have a local sewer authority permit. Specifically, the regulations prohibit the discharge of any pollutants that will interfere with or pass through the public sewer, and require industrial users to report any changes in their discharges to the local sewer authority. **Most printers discharging industrial wastewaters to the MSD are not SIUs.**

Step 1 for WASTEWATER



What is a wastewater "point source"?

The term "point source" is defined very broadly in the federal Clean Water Act. It means any discernible, confined and discrete conveyance, such as a pipe, ditch, channel, tunnel, conduit, discrete fissure, or container. It also includes vessels or other floating craft from which pollutants may be discharged.

What does "waters of the State of Missouri" mean?

The term "waters of the State of Missouri" is defined in the state laws and regulations. It means navigable waters, tributaries to navigable waters, interstate waters and intrastate waters which are used by interstate travelers for recreation or other purposes, as a source of fish or shellfish sold in interstate commerce, or for industrial purposes by industries engaged in interstate commerce. The definition has been interpreted to include virtually all surface waters in the state, including wetlands and short-lived streams.

Step 1 for WASTEWATER

✓ Your current status...

PrintSTEP defines wastewater as industrial process waters. It includes non-sanitary wastewater discharged from a particular point or pipe. It does not include wastewaters from non-contact cooling, storm water, or sanitary systems. Check the box that corresponds to how you discharge your wastewater:

Check one:	For WASTEWATER discharge, your facility:
<input type="checkbox"/>	discharges to the public sewer or treatment works and is <u>not</u> a Significant Industrial User (SIU)
<input type="checkbox"/>	discharges to the public sewer or treatment works and <u>is</u> a SIU
<input type="checkbox"/>	discharges to waters of the State of Missouri, requiring an individual General NPDES Permit

✓ Your Requirements....

The Missouri Department of Natural Resources (MODNR) will incorporate your current applicable local wastewater permits or permit applications into the PrintSTEP Agreement from the or local sewer authority, such as the Metropolitan St. Louis Sewer District (MSD). **The conditions specified in the local ordinances and permits, including fees, will be maintained throughout the PrintSTEP pilot program.**

Each facility shall operate within the standards specified by their current local sewer authority wastewater ordinances, permits and fees, where applicable, and the standards specified by federal, state and local laws, regulations and ordinances. Copies of the relevant sections of MODNR Regulation 10 CSR 20-6&7 and Metropolitan St. Louis Sewer District Ordinance 8472. You may ask your PrintSTEP Coordinator, Bill Hernlund at 314-301-7600, for copies of these documents.

Step 1 for WASTEWATER

If you discharge to the public sewer and are not a Significant Industrial User (SIU), you must:

Permitting Requirements

- ✓ Notify the local sewer authority, such as MSD, and get a permit to discharge industrial wastewater to a public sewer.
 - ✓ Comply with your local sewer authority's rules and ordinances.
-

Pollutant Control

- ✓ Please consider adopting some of the **Best Management Practices (BMPs)** from the following examples in Table 1:

<u>Table 1.</u> <u>Example Pretreatment Program BMPs for Printing and Publishing Facilities</u> <u>Film Processing:</u>	
1.	Do not use chrome-based film cleaners. They are a two part system that when mixed together form chromic acid.
2.	Use formaldehyde free film chemistry, if available.
3.	Test chemistry for activity prior to changing out in lieu of a routine changing schedule. A quality control device such as a gray scale with a half-tone pattern can be used for evaluation.
4.	Periodically adjust unit for proper feed rate of fixer, developer, and wash water.
5.	Properly maintain processing units.
6.	Periodically check squeegee rollers for undue wear and hardness.
7.	Use floating lids on storage containers for mixed working solutions to minimize waste and spoilage.
8.	Use chemistry before expiration date and use the oldest chemistry first over newer chemistry.
9.	Keep mixing area, apparatus, and containers clean. Use separate mixing containers for each type of chemistry.
10.	Mix only enough chemicals to be used during its effective life.
11.	Adopt Code of Management Practice for silver discharges.
12.	Investigate purchasing developer, fixer, and wash water recycling units, if cost effective.
13.	Investigate purchasing automatic mixing equipment, if cost effective.
14.	Investigate using an imagesetter, if cost effective.
15.	Investigate using direct-to-image carrier (e.g., plate, screen, etc.).
16.	For tray processing, use a stop bath prior to immersing film into the fix solution.
17.	For tray processing, use a squeegee to remove excess chemistry between baths.
18.	For tray processing, cover containers when not being used.
<u>Table 1, continued.</u>	

Step 1 for WASTEWATER

Image Carrier Preparation:

1. Do not use chrome-based plate cleaners. They are a two part system that when mixed together form chromic acid.
2. Test chemistry for activity prior to changing out in lieu of a routine changing schedule. A quality control device such as a gray scale with a half-tone pattern can be used for evaluation.
3. Periodically adjust unit for proper feed rate of developer, finisher, and wash water.
4. Properly maintain processing units.
5. Periodically check squeegee rollers for undue wear and hardness.
6. Use chemistry before expiration date and use the oldest chemistry first over newer chemistry.
7. Keep mixing area, apparatus, and containers clean. Use separate mixing containers for each type of chemistry.
8. Mix only enough chemicals to be used during its effective life.
9. For conventional lithographic plates, use aqueous-based plate development solution. Either recycle the spent chemistry, if appropriate, or properly dispose.
10. For waterless lithographic plates, do not discharge the spent chemistry. Either recycle the spent chemistry or properly dispose of it.
11. For bimetallic lithographic plates, do not discharge the spent chemistry.
12. For solvent-based plate developing solutions, do not discharge the spent chemistry. Either recycle the spent chemistry, if appropriate, or properly dispose.
13. Investigate purchasing wash water recycling units, if cost effective.
14. Investigate purchasing automatic mixing equipment, if cost effective.

Press and Postpress:

1. Remove excess inks, coatings, glues, and fountain solution from equipment prior to cleaning in a sink.
2. Water-based inks should be treated with micro/ultra filtration to remove color prior to discharging to public sewer.
3. For lithographic fountain solutions, do not use concentrates containing chrome. This needs to be confirmed with supplier, as MSDS will not identify it as an ingredient.
4. For lithographic fountain solutions, establish water quality testing program for incoming water for better process control.
5. For lithographic fountain solutions, install, only if cost effective, an incoming water treatment system to eliminate incoming water quality fluctuations.
6. For lithographic fountain solution recirculating systems, install in-line filtration to reduce contamination due to paper debris, ink, and other contaminants.

Step 1 for WASTEWATER

Table 1, continued.

7. For lithographic fountain solutions, install, only if cost effective, an automix system to provide for consistent press ready fountain solution.
8. For heatset web offset printing presses, install, only if cost effective, a closed loop chill roll cooling water system.
9. Remove excess ink from screens prior to cleaning in a sink.
10. Remove excess ink from equipment before cleaning in a sink.
11. Investigate feasibility of using high-pressure wash systems to clean screens to eliminate degreasers, emulsions and haze removers.
12. Install a water filtration system for ink particulates.

General:

1. Compressor blow down must be passed through an oil/water separator prior to discharge.
2. Permanently block all open floor drains in areas where chemicals are stored, used or dispensed.
3. Post warning signs at all sinks outlining acceptable and prohibited discharges.
4. Provide secondary containment for all chemicals and wastes that are stored in such a manner as to pose a threat to contaminate groundwater or cause an uncontrolled discharge to the public sewer.
5. If practical, recover and reuse dehumidifier and air conditioning condensate water.
6. For cooling towers, install, only if cost effective, a closed loop water recirculating system.

Reporting

- ✓ The PrintSTEP Printer must immediately report any accidental discharges to the local sewer authority, such as MSD, and the PrintSTEP Coordinator, Bill Hernlund.
- ✓ Report any significant changes in the facility's discharge requirements, volume or local sewer authority permit status by calling the PrintSTEP Coordinator, Bill Hernlund, at 314-301-7600.
- ✓ The PrintSTEP Annual Report, which can be found in Appendix D, includes significant changes in the facility's discharge requirements, local sewer authority permit status and whether any state or local sewer authority permit violations occurred.
- ✓ The PrintSTEP Annual Report is not required for facilities with Notification status for waste water, air, hazardous waste and storm water.

Step 1 for WASTEWATER

Standard Conditions

- ✓ Your facility must meet the local sewer authority requirements for prohibited pollutants and practices. These requirements can generally be found on your current local sewer discharge permits. This list is based on the Federal Prohibited Discharge Standards from 40 CFR 403.5, Missouri State Regulation 10 CSR 20-6, and/or Metropolitan St. Louis Sewer District (MSD) Ordinance 8472, where applicable. They may include:
 - 1) General prohibitions. You may not introduce into a public sewer any pollutant(s) which cause Pass Through or Interference (pollutants that may interfere with the operation of public sewers, like MSD).
 - 2) Affirmative Defenses. You shall have an affirmative defense in any action brought against you alleging a violation of these general prohibitions and the specific prohibitions that follow, where you can demonstrate that:
 - you did not know that your discharge, alone or combined with discharge(s) from other sources, would cause Pass Through or Interference; and
 - a local limit designed to prevent Pass Through and/or Interference was developed for each pollutant in your discharge that caused Pass Through or Interference, and that you were in compliance with these local limits before and during the Pass Through or Interference; or
 - if a local limit designed to prevent Pass Through and/or Interference has not been developed for the pollutant(s) causing the Pass Through or Interference, your discharge immediately before and during the Pass Through or Interference did not change substantially in nature or constituents from your prior discharge activity when the public sewer was in compliance with the General NPDES Permit requirements and, in the case of Interference, requirements for sewage sludge use or disposal.)
 - 3) Specific prohibitions. In addition, the following pollutants shall not be discharged to a public sewer:
 - pollutants which create a fire or explosion hazard in the public sewer, including, but not limited to, waste streams with a closed cup flashpoint of less than 140° Fahrenheit (60° Centigrade) using the test methods specified in 40 CFR 261.21.

Step 1 for WASTEWATER

- pollutants which will cause corrosive structural damage to the public sewer, but in no case having discharges with pH lower than 5.5 or higher than 11.5, unless pretreatment is in place specifically designed to accommodate such discharges;
- solid or viscous pollutants in amounts which will cause obstruction to the flow in the public sewer resulting in Interference;
- any pollutant, including oxygen-demanding pollutants (BOD, COD, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause Interference with the public sewer.
- heat in amounts which will inhibit biological activity in the public sewer resulting in Interference, but in no case heat in such quantities that the temperature at the Treatment Plant exceeds 40° C (104° F) unless the local sewer authority, such as MSD, approves alternate temperature limits.
- petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;
- pollutants which result in the presence of toxic gases, vapors, or fumes within the public sewer in a quantity that may cause acute worker health and safety problems;
- any trucked or hauled pollutants, except at discharge points designated by the local sewer authority, such as MSD.

Often local sewer authorities include additional prohibitions. It is a good idea to ask for clarification of the prohibitions for your facility and industrial processes from your local sewer authority, such as Metropolitan St. Louis Sewer District (MSD) Ordinance 8472.

Public Participation

- ✓ There are no public participation requirements for facilities that discharge wastewater to a public sewer, are not Significant Industrial Users, and also qualify for PrintSTEP Notification status for hazardous waste, storm water and air emissions.

Modifications

- ✓ If your local sewer authority wastewater permit status changes while operating under a PrintSTEP Agreement, it will be necessary to notify the PrintSTEP Coordinator, Bill Hernlund. Please refer to Chapter 2 of the *Missouri PrintSTEP Plain Language Workbook* for guidance on updating your PrintSTEP Agreement.

Step 1 for WASTEWATER

If you are designated as an SIU, you must follow the previously listed requirements on pages 1-5 through 1-12. The PrintSTEP Agreement may also incorporate any local sewer authority permits, ordinances, rules and regulations, such as those generally outlined on the next three pages:

Pollutant Control

- ✓ Comply with the requirements set out by your current local public sewer permit. A local sewer authority with an approved pretreatment program will control industrial users to ensure compliance with pretreatment standards and requirements. In cases where an industrial user is significant, an individual control mechanism (permit) is issued to that user. Significant industrial users (SIUs) are those that:
 - ✎ discharge more than 25,000 gallons per day of process wastewater, or
 - ✎ contribute 5% or more of the hydraulic or organic capacity of the local wastewater plant, or
 - ✎ are considered to have the potential to adversely impact the local plant.
- ✓ Control mechanisms or current local public sewer permits must include a statement of duration; a statement of non-transferability; applicable effluent limits; monitoring, reporting and record keeping requirements; a statement of applicable penalties; and, if necessary, compliance schedules.
- ✓ Current local public sewer permits are site-specific and tailored to the individual users. The ability to revoke or modify a current local public sewer permit enables the local sewer authority to accommodate changes in state, federal, and local requirements as well as changes in the user's own discharge.

Monitoring Requirements

- ✓ Monitoring requirements are dependent on effluent limitations.
- ✓ Limited pollutants will generally require some form of monitoring to confirm compliance has been achieved. The frequency of monitoring will be dependent on compliance status and size of the facility being permitted.
- ✓ In the case of numeric effluent limits, there are pollutant sampling and analysis requirements. The effluent parameters (i.e. Flow, **Biological Oxygen Demand (BOD)**, settleable solids, metals and pH) concentrations, locations, frequency, and sample types are specified in the current local public sewer permits. There are also requirements to conduct inspections to verify compliance.

Step 1 for WASTEWATER

Reporting Requirements

A PrintSTEP Annual Report needs to be submitted to the Missouri Department of Natural Resources (MODNR) by April 1st each year. For your convenience, MDNR will send you a copy of the PrintSTEP Application once a year to update any modifications and changes that occurred over the previous year. Data regarding limits and monitoring must be reported to the local sewer authority as well. The majority of the federal reporting requirements related to the Pretreatment Program is found in 40 CFR 403.12, including:

- ✓ Monitoring Reports- PrintSTEP Printer will summarize the results of all required monitoring.
- ✓ Additional Monitoring- PrintSTEP Printer must report any additional monitoring that is performed at the point of compliance using approved monitoring and analytical techniques.
- ✓ Automatic Resampling- If the results of the PrintSTEP Printer's wastewater analysis indicate that a violation of the local sewer authority permit has occurred, the PrintSTEP Printer must inform the local sewer authority of the violation within 24 hours, repeat the sampling and analyses, then submit the written results of the repeat analyses within 30 days of the first violation.
- ✓ Accidental Discharge Report- PrintSTEP Printer must immediately report any accidental discharges to the local sewer authority and the PrintSTEP Coordinator. The local sewer authority shall provide detailed instructions concerning where the reports are to be sent and what they must include. Many local sewer authorities have reporting forms that are used.

Special Conditions

- ✓ Comply with any additional or special monitoring requirements that are included in your local public sewer permit. This may include special monitoring and reporting, or development of special industrial management practices.
- ✓ Comply with any additional conditions such as a Reopener Clause which will describe any causes for modifying the local public sewer permit arising out of facts that are not common to all industrial users which will or are likely to occur during its effective period. Examples of parameters that may have limits are:

Step 1 for WASTEWATER

- The local public sewer permit may be reopened and modified to incorporate any new or revised requirements contained in state and federal categorical pretreatment rules for the Printing Industry.
 - The local public sewer permit may be reopened and modified to incorporate any new or revised requirements resulting from the local sewer authority's re-evaluation of its local limits.
 - The local public sewer permit may be reopened and modified to incorporate any new or revised requirements developed by the local sewer authority as are necessary to ensure local sewer authority compliance with applicable sludge management.
- ✓ A Compliance Schedule, if needed, to provide the facility more time to come into compliance with local public sewer permit conditions.

Public Participation

- ✓ A printer classified as a Significant Industrial User (SIU) must meet, at a minimum, the General (Limited) Public Participation requirements described in Step 4 of Chapter 1 in this workbook. Actual requirements also depend on the facility's status regarding the hazardous waste, storm water and air emissions.

Modifications

- ✓ The ability to revoke or modify a local public sewer permit enables the local sewer authority to accommodate changes in State, Federal, and local requirements as well as changes in the user's own discharge.
- ✓ Local public sewer permit issued to an SIU may include information beyond the minimums required by the federal regulations.
- ✓ If your local public sewer wastewater permit status changes while operating under a PrintSTEP Agreement, it will be necessary to notify the PrintSTEP Coordinator, Bill Hernlund, at 314-301-7600. Please refer to Chapter 2 of the *Missouri PrintSTEP Plain Language Workbook* for guidance on updating your PrintSTEP Agreement.
- ✓ All applicable local public sewer permit conditions are incorporated into the PrintSTEP Agreement.

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If you require a National Pollutant Discharge Elimination System (NPDES) Permit:

- ✓ A **National Pollutant Discharge Elimination System (NPDES)** permit, as issued by the Missouri Department of Natural Resources (MODNR), is required for all industrial facilities that discharge process wastewaters to the waters of the state instead of a public water treatment system. The requirements for a General NPDES Permit can be found in state regulations 10 CSR 20-6 & 7 and General Permit MO-R130000.
- ✓ All General NPDES Permits are site-specific, depending on what treatment facilities are present, and must include the following components:

Pollutant Control

- ✓ Comply with all written General NPDES Permit requirements.
- ✓ Describe any process wastewater treatment systems.
- ✓ Meet your site-specific effluent limitations and Best Management Practices.

Monitoring Requirements

- ✓ Conduct monitoring analyses and activities at the specified frequencies designated in your General NPDES Permit.
- ✓ Monitor BMPs to assess compliance with effluent limitations.
- ✓ Monitor each outfall for site specific parameters to assess compliance with effluent limitations.
- ✓ Determine flow as required.
- ✓ Sample at designated locations.
- ✓ Handle and preserve samples and laboratory analyses in accordance with 40 CFR Part 136.

Record Keeping

- ✓ Inspection logs/reports to the MODNR must be maintained for BMPs .
- ✓ Include the name of sampling personnel, dates, times, locations sampled, and results in the monitoring records.
- ✓ Include date analyzed, analyst, method used, and results in analysis records.
- ✓ Maintain the sampling and analytical records for three years.

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Reporting Requirements

- ✓ A PrintSTEP Annual Report needs to be submitted to the MODNR describing the facility's emissions and wastes and updating any information as necessary.
- ✓ Include additional monitoring data in all daily and monthly calculations.
- ✓ If results of analysis indicate a violation, you must 1) notify the General NPDES Permit authority orally within 24 hours of becoming aware and 2) submit a written report within 5 days.
- ✓ Immediately notify the MODNR of any **accidental discharge** of prohibited substances or any slug loads or spills. **A written report must be submitted within 5 days** and must include:
 - a description and cause of the upset, slug load or accidental discharge impact on the PrintSTEP Printer's compliance status,
 - location, type, concentration and volume of the waste,
 - duration of non-compliance, including exact times and dates and if the problem is continuing and the time when compliance is expected to occur,
 - all steps taken to reduce, eliminate and/or prevent recurrence.
- ✓ Include certification by the responsible person for all information.
- ✓ **Immediately report any emergencies to the local sewer authority and appropriate agencies, such as the Fire Department or Police.**

Special Conditions

- ✓ Meet any special conditions, which may include special studies, additional monitoring, site specific **Best Management Practices (BMPs)**, pollution prevention, compliance schedules.

Standard Conditions

The Missouri Department of Natural Resources (MODNR) **Water Pollution Control Program (WPCP)** will determine the appropriate level of detail for the following major components of the Standard Conditions:

- ✓ Comply with all requirements of the General NPDES Permit, properly operate and maintain the facility, provide information upon request, reapply at the end of the permit term, mitigate any harm done to the environment and have the proper signatures on all reports.
- ✓ The General NPDES Permit may be modified or revoked for cause.

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- ✓ The General NPDES Permit does not convey property rights.
- ✓ The MODNR may inspect, sample and analyze the discharges upon request.
- ✓ Notify the MODNR and PrintSTEP Coordinator about planned changes, anticipated non-compliance, ownership changes (General NPDES Permits are not transferable), monitoring reports, compliance schedules, and 24 hour oral reports of violations that might endanger the public health or the environment.

Public Participation

- ✓ A printer operating with a General NPDES Permit to discharge industrial wastewater must meet, at a minimum, the Full Public Participation requirements of a PrintSTEP Agreement, as described in Step 4 of Chapter 1 in this workbook.

Modifications

- ✓ For minor modifications, send notice to the MODNR to determine if the modification is minor or significant.
- ✓ For major modifications, reopen the General NPDES Permit with the MODNR Water Pollution Control Program.
- ✓ If your PrintSTEP wastewater status changes, or your facility starts to discharge the wastewater to a public sewer system then you can modify your Agreement by contacting your PrintSTEP Coordinator, Bill Hernlund, at (314)-301-7600. Please refer to Chapter 2 for details.

To obtain copies of the Wastewater & Storm Water regulations:

Metropolitan St. Louis Sewer District (MSD):

MSD Ordinance Number 8472 and other information, can be obtained by calling Customer Service at 314-768-6260, or on their internet website at:
<http://www.msd.st-louis.mo.us>.

State and Federal Regulations:

State regulations may be obtained from the Missouri Secretary of State's Office at (573)-751-4015 or on the Internet at <http://mosl.sos.state.mo.us/csr/10csr.htm-20>. Federal regulations may be obtained through the Government Printing Office at (202)-512-1803 or access the documents at <http://www.access.gpo.gov/nara/cfr/cfr-table-search.html>

Step 1 for HAZARDOUS WASTE



Where did all those Hazardous Waste Laws come from?

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)

This is the federal law that tracks hazardous waste from “cradle-to-grave”. Under RCRA, hazardous waste is regulated from the point it is generated (the “cradle”) through its ultimate point of disposal (the “grave”). This law and its implementing regulations define hazardous waste, and specifies labeling, storage, treatment, disposal and reporting requirements for these wastes. RCRA regulations generally require that printers document the amount and type of wastes they ship and where it is treated or disposed.

Since the federal law was enacted in 1976, the State of Missouri enacted Sections §260.350-.430 RSMo, Missouri’s equivalent RCRA laws, and 10 CSR 25, the state’s equivalent RCRA regulations. For purposes of this document, the requirements described in the following Hazardous Waste section represent the state’s current laws and regulations that are applicable to printers that generate hazardous wastes. This discussion applies only to printers that generate hazardous wastes, and not to the few printers that might also treat, store and dispose of their hazardous wastes and have an operating permit.

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Which wastes are considered hazardous?

A waste is **hazardous** if it:

- ✓ exhibits hazardous characteristics OR
- ✓ is listed in the federal 40 CFR 262 or state 10 CSR 25 regulations.

Characteristic Hazardous Wastes are wastes that have any of these hazardous characteristics:

- ☛ **Ignitable** -- Easily catches fire; flashpoint is below 140 degrees Fahrenheit. (See your MSDS.) An example is isopropyl alcohol.
- ☛ **Corrosive** -- Liquids containing water (aqueous liquids) that easily corrode materials or human tissue and have a pH of less than or equal to 2 or greater than or equal to 12.5. An example is battery acid.
- ☛ **Reactive** -- Potentially explosive or produces toxic gases when mixed with water, air, or other incompatible materials. Printers do not normally generate reactive wastes.
- ☛ **Toxic** -- If laboratory testing of a chemical extract of your waste shows specific constituents, such as cadmium, chromium, or silver, and exceeds specified levels, the waste is toxic. Examples may include plate processing chemicals and waste fixer.

Listed Hazardous Wastes are certain wastes that EPA has designated as hazardous. Each listed waste has a waste code, beginning with the letter “U,” “F,” “P,” or “K.” Any nonhazardous materials that are contaminated with listed waste, such as shop towels, are also considered listed waste. (Please refer to Case Study #12, *Shop Towels*, in Chapter 4 for an example.)

Listed hazardous waste printers may generate include:

- ✓ waste solvents (“F-Solvents” such as methylene chloride)
- ✓ unused, discarded or off-specification materials (e.g., unused methanol, “U” wastes)

Step 1 for HAZARDOUS WASTE

☐ Your current status...

Prior to applying for the PrintSTEP Program, each facility must have their current applicable Hazardous Waste permits or registrations, where applicable, from the MODNR Hazardous Waste Program or local environmental authorities (county or municipal). **The conditions of the local ordinances, permits or registrations, including fees, shall remain active throughout the pilot program.**

Now let's determine your RCRA generator status. The table below gives a brief description of the different generator statuses. Review your hazardous waste permit or operation records for the past 12 months and check the box corresponding to your hazardous waste generator status. The amount of hazardous wastes you generate may change from month to month. If you are a printer that falls into different generator categories at different times, you can try to satisfy the more stringent requirements to simplify compliance. If you have questions about your generator status, please call MODNR TAP at (800)-361-4827 or the Hazardous Waste Program at (573)-751-3176.

Go To	What is your HAZARDOUS WASTE generator status?
Page 1-23	► If you are a Conditionally Exempt Small Quantity Generator
Page 1-24	► If you are a Small Quantity Generator
Page 1-29	► If you are a Large Quantity Generator

Includes all hazardous waste that you generate, except hazardous waste that is exempt from regulation, such as lead acid batteries managed under the requirements of 40 CFR part 266, Subpart G. Generally excludes Treatment, Storage, and Disposal (TSD) facilities, which are extremely rare for printers.

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✓ Your Requirements....

The Missouri Department of Natural Resources (MODNR) will incorporate your current applicable local hazardous waste permits or permit applications into the **PrintSTEP Agreement** from the or local environmental authorities. **The conditions specified in the local ordinances and permits, including fees, will be maintained throughout the PrintSTEP pilot program.**

Each facility shall maintain their current permits or registrations, including fees, and operate within the hazardous waste standards specified by current federal, state and local laws, regulations and ordinances. Please refer to Missouri Department of Natural Resources regulation 10 CSR 25 for reference.

A printer's regulatory requirements for management of hazardous wastes increase commensurate with their generator status, which is based on the amount of hazardous waste that the printer generates. Since only facilities having current permits are approved for the PrintSTEP program, then the current generator status should be designated on the permit itself.

To understand your requirements for the management of waste that you generate, you must determine which of the wastes that you generate are hazardous. A waste can be hazardous because it is listed in the regulations or because it exhibits one of the following RCRA characteristics: **ignitability, corrosivity, reactivity, or toxicity**. These characteristics are defined in the regulations.

After determining which wastes are hazardous, total the weights of the hazardous wastes that you expect to generate each month. Also consider the amounts of hazardous waste that you are likely to accumulate at your business. The amount of hazardous waste that you generate in one month or accumulate at any one time will determine which requirements apply to you. Your business may be a conditionally exempt small quantity generator, a small quantity generator or a large quantity generator.

Please read the following paragraphs that apply to your designated generator status. Although a reading of the law and regulations is necessary to determine the exact requirements that apply, the basic requirements for conditionally exempt small quantity generators, small quantity generators and large quantity generators are provided in this document.

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Conditionally Exempt Small Quantity Generators

You are a Conditionally Exempt Small Quantity Generator if you generate in any calendar month or accumulate at any one time no more than 100 kg/mo (220 lbs) of hazardous waste, or 1 kg/mo (2.2 lbs) of acute hazardous waste, or 100 kg/mo of acute hazardous waste spill residue.

If you are a Conditionally Exempt Small Quantity Generator, you must:

Manage Materials to Prevent Release to the Environment

- ✓ Either treat waste on-site if you qualify as one of the following types of facilities, or ensure delivery of waste to one of the following types of facilities:
 - permitted hazardous waste treatment, storage, or disposal facility
 - interim status hazardous waste treatment storage or disposal facility
 - a facility that beneficially uses or reuses, or legitimately recycles or reclaims its waste
 - a facility that treats its waste prior to beneficial use, reuse, or legitimate recycling or reclamation
 - a universal waste handler in accordance with standards
 - a publicly owned wastewater treatment system, provided that the facility has approved the receipt of the hazardous waste

Keep Records

- ✓ Maintain records of test results, waste analyses and other hazardous waste determinations for at least three years.

Public Participation

- ✓ There are no public participation requirements for Conditionally Exempt Small Quantity Generators who also qualify for PrintSTEP Notification status for storm water, wastewater and air emissions. Please refer to Step 4 for details.

Modify Generator Status, if Necessary

- ✓ If your generator status changes, call your PrintSTEP Coordinator, Bill Hernlund, at (314)-301-7600. Please also refer to Chapter 2 of the *Missouri PrintSTEP Plain Language Workbook* for guidance on updating your PrintSTEP Agreement.

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Small Quantity Generator (SQG)

You are a Small Quantity Generator if you generate greater than 100 kg, but less than 1,000 kg (220 lbs and 2,200 lbs) of hazardous waste and less than one kg of acutely hazardous waste in a calendar month or if you accumulate between 100 and 1,000 kg at any one time. If you do not already have an EPA identification number, you must obtain one by using the Notification of Regulated Waste Activity form. You may obtain assistance by contacting the MODNR Hazardous Waste Program at (573) -751-3176.

If you are an SQG, you may accumulate hazardous waste on-site for up to 180 days without a hazardous waste permit if you comply with the following requirements. You can accumulate for up to 270 days if you must transport the waste more than 200 miles for treatment, storage or disposal. The Hazardous Waste Program may grant limited storage time extensions. If you exceed these limits or do not follow the requirements of a SQG described here, you are considered a hazardous waste treatment, storage or disposal facility and must obtain a facility permit.

Manage Materials Appropriately

- ✓ Accumulate no more than 1000 kg of hazardous waste on-site
- ✓ Accumulate waste in tanks and containers, such as 55-gallon drums. Key requirements for managing hazardous waste in containers include:
 - label each container with the words "Hazardous Waste," and mark each container with the date the waste accumulation begins.
 - package, label and mark container according to Department of Transportation requirements during the entire on-site storage period.
 - use a container made of a material that is compatible with the hazardous waste to be stored to prevent the waste from reacting with or corroding the container.
 - keep all containers holding hazardous waste closed during storage, except when adding or removing waste. Handle and store the containers in a way that will prevent release of the contents.
 - inspect areas where containers are stored at least weekly. Inspect areas subject to spills daily. Look for leaks and other evidence of container deterioration.
 - maintain the containers in good condition. If a container leaks, put the hazardous waste in another container, or otherwise contain it.
 - place incompatible wastes or materials in separate containers. Do not place hazardous waste in an unwashed container that previously held an incompatible material.
 - separate containers storing incompatible waste using a dike, berm or wall.
 - store ignitable hazardous waste at least 50 feet from the property boundary.
 - protect containers of hazardous waste from ponded liquids.
 - place "No Smoking" signs near ignitable or reactive wastes.

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Tank requirements were not included here because of their limited use by printers. If you accumulate waste in tanks, you should refer to 10 CSR 25-7.265(J) and 40 CFR part 265, Subpart J (Tank Systems) for a list of requirements, or call your PrintSTEP Coordinator, Bill Hernlund, at (314) 301-7600 for assistance.

Meet Land Disposal Restrictions (LDR) Requirements

- ✓ Land disposal is a broad term that includes placing hazardous wastes on the land to dispose of it or to store it.
- ✓ The LDR program requires that waste be treated to reduce the hazardous constituents to acceptable levels or treated using specific technology before it is placed on the land. You must ensure that your waste is treated to meet LDR treatment standards if it is to be land disposed.
- ✓ Most printers will probably have their designated hazardous waste treatment, storage or disposal facility do the treatment. With the initial shipment of waste to each designated hazardous waste treatment, storage, or disposal facility, send a one-time written notice to each facility receiving the waste, and keep a copy in your file. This notice must include information regarding whether or not the waste meets treatment standards or whether the waste is excluded by the definition of hazardous or solid waste or is otherwise exempt.
- ✓ If you choose to treat the waste yourself, please call the Hazardous Waste Program to find out which additional requirements apply to your situation.

Prevent Accidents

- ✓ Maintain and operate your business to minimize the possibility of a fire, explosion or other accident involving hazardous waste or hazardous waste constituents. If your business is an SQG, you must have:
 - an alarm or emergency communications device that is immediately accessible to the people who handle hazardous waste on-site;
 - a device immediately available at the scene of operations, capable of summoning emergency assistance from off-site;
 - portable fire extinguishers or other appropriate fire control devices, spill control materials, and decontamination supplies; and
 - water at adequate volume and pressure to supply water hose streams, foam-producing equipment, automatic sprinklers, or water spray systems.
- ✓ ***You also must:***
 - test and maintain all equipment to ensure proper operation;
 - allow sufficient aisle space to permit the unobstructed movement of people and emergency response equipment to any area of the facility operation;
 - attempt to secure arrangements with fire departments, police, emergency response teams, equipment suppliers and local hospitals, as appropriate, to provide services in the event of an emergency.

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Response to Emergencies

- ✓ Designate an emergency coordinator who will be on-site or available to respond to an emergency at the facility within a short time. This person will have the responsibility of coordinating all emergency response measures.
- ✓ Post the following information next to the telephone;
 - the name and telephone number of the emergency coordinator;
 - the location of fire extinguishers, spill control materials, and fire alarm; and
 - the telephone number of the fire department.
- ✓ The emergency coordinator or his designee must respond to any emergencies that arise. The applicable responses are as follows:
 - In the event of fire, call the fire department or attempt to extinguish the fire using a fire extinguisher.
 - In the event of a spill, contain the flow of hazardous waste to the extent possible, and as soon as is practicable, clean up the hazardous waste and any contaminated soil.
 - In the event of a fire, explosion or other release which could threaten human health outside the facility, or when the printer has knowledge that a spill has reached surface water, the printer must immediately notify the National Response Center using their 24-hour toll free number, (800) 424-8802. The report must include the following information:
 - the name, address and generator identification number of the printer;
 - the date, time and type of incident;
 - the quantity and type of hazardous waste involved in the incident;
 - the extent of injuries, if any; and
 - the estimated quantity and disposition of recovered materials, if any.

Note: Although not a requirement for SQGs, a contingency plan would provide an organized and coordinated course of action for possible emergencies at the facility.

Use Satellite Accumulation Areas Appropriately

You may accumulate as much as 55 gallons of hazardous waste or one quart of acutely hazardous waste listed in 40 CFR 261.33(e) in containers at or near any point of generation that is under the control of the operator of the process generating the waste.

If you use satellite accumulation areas, you must:

- ✓ Move wastes in excess of 55 gallons from the satellite area within 3 days and manage them in accordance with requirements of 180-day accumulation or other applicable requirements.
- ✓ Mark the containers with the words "Hazardous Waste" or other identifying words.
- ✓ Mark the accumulation start date on the container.
- ✓ Mark containers holding waste in excess of 55 gallons with the date that excess amount began accumulating.
- ✓ Limit satellite accumulation to less than one year.
- ✓ Use a container made of a material that is compatible with the hazardous waste to

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be stored.

- ✓ Keep all containers holding hazardous waste closed during storage, except when adding or removing waste.
- ✓ Maintain the containers in good condition. If a container leaks, put the hazardous waste in another container, or otherwise contain it.

Meet Pre-Transport and Transport Requirements

- ✓ If you are sending your waste off-site, you must use a licensed hazardous waste transporter to send the waste to a facility permitted to handle the waste. You may check with the Hazardous Waste Program to be sure that the facility you select has all necessary permits.
- ✓ When shipping waste off-site, package, label and mark your shipment and placard the vehicle in which your waste is shipped as specified in Department of Transportation regulations. Most printers probably use a commercial transporter to ship hazardous waste. These transporters can advise you on specific requirements for placarding, labeling, marking, and packaging. However, you remain responsible for compliance. For additional information, call the Department of Transportation hazardous materials information line at (202) 366-4488.
- ✓ You do not need to manifest the waste if you have and retain a copy of a contractual Agreement with a waste reclaimer that specifies the types and frequencies of shipments, and the vehicle used to transport the waste is owned and operated by the waste reclaimer.
- ✓ If you do not meet the Agreement requirements specified above, obtain a hazardous waste manifest from the Hazardous Waste Program and prepare the manifest to accompany your shipment. A hazardous waste manifest is designed to track hazardous waste from generation to disposal and will help you track your waste during shipment to ensure it arrives at the proper destination.
- ✓ Fill in all parts of the manifest, including all Missouri information. The transporter will sign the completed manifest when the shipment is accepted for transport. A representative of the designated hazardous waste treatment, storage or disposal facility will sign the form when the shipment is received and send a copy back to you. You must keep this copy on file for three years.
- ✓ Do not use manifest continuation sheets.
- ✓ Provide summary manifest reports to the Hazardous Waste Program annually.

Train Personnel

- ✓ Ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures relevant to their responsibilities.

Public Participation

- ✓ There are no public participation requirements for Small Quantity Generators who also qualify for PrintSTEP Notification status for wastewater, storm water and air emissions. Please refer to Step 4 in Chapter 1 for details.

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Provide Exception Report, if Necessary

- ✓ If you do not receive a signed copy of the manifest from the designated hazardous waste treatment, storage or disposal facility within 35 days of shipment, you must submit an Exception Report to the Hazardous Waste Program within 45 days of the shipment. The Exception Report must include a copy of the manifest and a cover letter signed by you explaining efforts you have taken to locate the waste and the results of those efforts.

Keep Records

- ✓ Keep records of test results, waste analyses and other hazardous waste determinations for at least 3 years
- ✓ Keep your copy of the signed manifest for at least three years. If you have a copy that was signed and returned from the hazardous waste treatment, storage or disposal facility, retain that one instead.

Modify Generator Status, if Necessary

- ✓ If your generator status changes, call your PrintSTEP Coordinator, Bill Hernlund, at (314)-301-7600. Please also refer to Chapter 2 of the *Missouri PrintSTEP Plain Language Workbook* for guidance on updating your PrintSTEP Agreement.

Note: If your facility shuts down permanently during the PrintSTEP pilot, other requirements may apply. Contact Bill Hernlund at (314) 301-7600 for assistance.

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Large Quantity Generator

You are a Large Quantity Generator if you generate or accumulate greater than 1000 kg (2,200 lbs) of hazardous waste or more than one kg of acutely hazardous waste in a calendar month. If you do not already have an EPA identification number, you must obtain one by using the Notification of Regulated Waste Activity form. You may contact the Hazardous Waste Program at (573) 751-3176 for assistance.

If you are an LQG, you may accumulate hazardous waste on-site for up to 90 days without a hazardous waste permit if you comply with the following requirements. The Hazardous Waste Program may grant limited extensions. If you exceed these limits or do not follow the requirements of a LQG described here, you are considered a hazardous waste treatment, storage or disposal facility and must obtain a facility permit.

Manage Materials Appropriately

- ✓ Accumulate waste in tanks and containers, such as 55-gallon drums. Key requirements for managing hazardous waste in containers include:
 - label each container with the words "Hazardous Waste," and mark each container with the date the waste accumulation begins.
 - package, label and mark container according to Department of Transportation requirements during the entire on-site storage period.
 - use a container made of a material that is compatible with the hazardous waste to be stored to prevent the waste from reacting with or corroding the container.
 - keep all containers holding hazardous waste closed during storage, except when adding or removing waste. Handle and store the containers in a way that will prevent a release of the contents.
 - inspect areas where containers are stored at least weekly. Inspect areas subject to spills daily. Look for leaks and other evidence of container deterioration.
 - maintain the containers in good condition. If a container leaks, put the hazardous waste in another container, or otherwise contain it.
 - Provide and maintain a containment system for storage areas containing more than 1,000 kg of liquid hazardous waste.
 - meet special standards for ignitable or reactive waste.
 - place incompatible wastes or materials in separate containers. Do not place hazardous waste in an unwashed container that previously held an incompatible material.
 - manage hazardous waste in containers according to air emission standards for process vents; equipment leaks; and tanks, surface impoundments and containers. (CFR part 265, subpart AA, BB, and CC).
 - separate containers storing incompatible waste using a dike, berm or wall.
 - store ignitable hazardous waste at least 50 feet from the property boundary.
 - protect containers of hazardous waste from ponded liquids.
 - place "No Smoking" signs near ignitable or reactive wastes.

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Tank, drip pad, and containment building requirements were not included here because of their limited use by printers. If you accumulate waste in tanks or have drip pads or containment buildings, you should refer to 10 CSR 25-7.265(J), (W) or (DD) and 40 CFR part 265, Subpart J, W, and/or DD for a list of requirements, or call TAP locally at (314) 301-7600, or the TAP Hotline at 800-361-4827 for assistance.

Meet Land Disposal Restrictions (LDR) Requirements

- ✓ Land disposal is a broad term that includes placing hazardous wastes on the land to dispose of it or to store it.
- ✓ The LDR program requires that waste be treated to reduce the hazardous constituents to acceptable levels or treated using specific technology. You must ensure that your waste is treated to meet LDR treatment standards if it is to be land disposed.
- ✓ Most printers will probably have their designated hazardous waste treatment, storage or disposal facility do the treatment. With the initial shipment of waste to each designated hazardous waste treatment, storage, or disposal facility, send a one-time written notice to each facility receiving the waste, and keep a copy in your file. This notice must include information regarding whether or not the waste meets treatment standards or whether the waste is excluded by the definition of hazardous or solid waste or is otherwise exempt.
- ✓ If you choose to treat the waste yourself, please call the Hazardous Waste Program to find out which additional requirements apply to your situation.

Prevent Accidents

- ✓ Maintain and operate your business to minimize the possibility of a fire, explosion or other accident involving hazardous waste or hazardous waste constituents. If your business is an LQG, you must have:
 - an alarm or emergency communications device that is immediately accessible to the people who handle hazardous waste on-site;
 - a device immediately available at the scene of operations, capable of summoning emergency assistance from off-site;
 - portable fire extinguishers or other appropriate fire control devices, spill control materials, and decontamination supplies; and
 - water at adequate volume and pressure to supply water hose streams, foam-producing equipment, automatic sprinklers, or water spray systems.
- ✓ You also must:
 - test and maintain all equipment to ensure proper operation, and
 - allow sufficient aisle space to permit the unobstructed movement of people and emergency response equipment to any area of the facility operation.

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Response to Emergencies

- ✓ Designate an emergency coordinator who will be on-site or available to respond to an emergency at the facility within a short time. An emergency coordinator must be on-site or on call at all times. This person will have the responsibility of coordinating all emergency response measures.
- ✓ Have a contingency plan designed to minimize hazards from fires, explosions, or any unplanned release of hazardous waste or constituents. A contingency plan should provide information that would be useful if an accident occurred at the site;
 - a description of the arrangements that have been made with emergency response agencies;
 - the names, addresses and telephone numbers of the emergency coordinators;
 - a list of emergency equipment, including description, location and capabilities; and
 - an evacuation plan, if applicable, designating primary and secondary routes and the evacuation signal.
 - attempt to secure arrangements with fire departments, police, emergency response teams, equipment suppliers and local hospitals, as appropriate, to provide services in the event of an emergency.
- ✓ Keep a copy of the contingency plan on-site and provide copies to all local police and fire departments, hospitals, and emergency response teams that may be called upon to provide emergency services.
- ✓ In the event of a fire, explosion or other release which could threaten human health outside the facility, or when you know that a spill has reached surface water, you must immediately notify the National Response Center at (800)-424-8802, and MODNR local emergency at 636-938-9150 to report the following information:
 - the name, address and generator identification number of the printer;
 - the date, time and type of incident;
 - the quantity and type of hazardous waste involved in the incident;
 - the extent of injuries, if any; and
 - the estimated quantity and disposition of recovered materials, if any.

Train Personnel

- ✓ Provide training for facility personnel who handle or manage hazardous waste. This must include instruction in hazardous waste management procedures and emergency response. Maintain records of training until facility closure.
- ✓ Ensure that your employees receive the training within 6 months from the start of their employment and that the employees receive the training before working in an unsupervised position.
- ✓ Provide an annual review of the initial training for your employees.
- ✓ Develop a personnel training plan that includes the job title, job description and name of employee filling each position; a description of the training that will be provided to each employee and the training that each employee has completed.

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Use Satellite Accumulation Areas Appropriately

You may accumulate as much as 55 gallons of hazardous waste or one quart of acutely hazardous waste listed in 40 CFR 261.33(e) in containers at or near any point of generation that is under the control of the operator of the process generating the waste.

If you use satellite accumulation areas, you must:

- ✓ Move wastes in excess of 55 gallons from the satellite area within 3 days and manage them in accordance with requirements of 180-day accumulation or other applicable requirements.
- ✓ Mark the containers with the words "Hazardous Waste" or other identifying words.
- ✓ Mark containers holding waste in excess of 55 gallons with the date that excess amount began accumulating.
- ✓ Limit satellite accumulation to less than one year.
- ✓ Use a container made of a material that is compatible with the hazardous waste to be stored.
- ✓ Keep all containers holding hazardous waste closed during storage, except when adding or removing waste.
- ✓ Maintain the containers in good condition. If a container leaks, put the hazardous waste in another container, or otherwise contain it.

Meet Pre-Transport and Transport Requirements

- ✓ If you are sending your waste off-site, you must use a licensed hazardous waste transporter to send the waste to a facility permitted to handle the waste. Check with the Hazardous Waste Program at (573)-751-3176 to be sure that the facility you select has all necessary permits.
- ✓ When shipping waste off-site, package, label and mark your shipment and placard the vehicle in which your waste is shipped as specified in Department of Transportation regulations. Most printers probably use a commercial transporter to ship hazardous waste. These transporters can advise you on specific requirements for placarding, labeling, marking, and packaging. However, you remain responsible for compliance. For additional information, call the Department of Transportation hazardous materials information line at (202) 366-4488.
- ✓ Obtain a hazardous waste manifest from the Hazardous Waste Program and prepare the manifest to accompany your shipment. A hazardous waste manifest is designed to track hazardous waste from generation to disposal and will help you track your waste during shipment to ensure it arrives at the proper destination.
- ✓ Fill in all parts of the manifest, including all Missouri information. The transporter will sign the completed manifest when the shipment is accepted for transport. A representative of the designated hazardous waste treatment, storage or disposal facility will sign the form when the shipment is received and send a copy back to you. You must keep this copy on file for three years.
- ✓ Do not use manifest continuation sheets.
- ✓ Provide summary manifest reports to the Hazardous Waste Program quarterly.

Step 1 for HAZARDOUS WASTE

Provide Appropriate Reports

- ✓ A PrintSTEP annual report is required to be submitted to the MODNR describing your facility's emissions and wastes and updating information as necessary.
- ✓ If you do not receive a signed copy of the manifest from the designated hazardous waste treatment, storage or disposal facility within 35 days of shipment, you must submit an Exception Report to the Hazardous Waste Program within 45 days of the shipment. The Exception Report must include a copy of the manifest and a cover letter signed by you explaining efforts you have taken to locate the waste and the results of those efforts.

Keep Records

- ✓ Keep records of test results, waste analyses and other hazardous waste determinations for at least 3 years.
- ✓ Keep personnel training records until the facility closes.
- ✓ Keep copies of your biennial report for at least 3 years.
- ✓ Keep copies of exception reports for at least 3 years.
- ✓ Keep your copy of the signed manifest for at least three years. If you have a copy that was signed and returned from the hazardous waste treatment, storage or disposal facility, retain that one instead.

Public Participation

- ✓ A printer classified as a Large Quantity Generator must meet, at a minimum, the Limited Public Participation requirements of PrintSTEP (please see Step 4 of Chapter 1 for a description of these requirements). Your ultimate public participation requirements will depend on your status with regard to hazardous waste, storm water, wastewater and air emissions.

Modify Generator Status, if Necessary

- ✓ If your generator status changes, call your PrintSTEP Coordinator, Bill Hernlund, at (314)-301-7600 to discuss modifications to your PrintSTEP Agreement. Please also refer to Chapter 2 of the *Missouri PrintSTEP Plain Language Workbook* for guidance.
- ✓ Note: If your facility shuts down permanently during the PrintSTEP pilot, other requirements may apply. Contact your PrintSTEP Coordinator, Bill Hernlund, at (314)-301-7600 for assistance.

Step 1 for HAZARDOUS WASTE

To obtain copies of the state and federal Hazardous Waste regulations:

Missouri Code of State Regulations:

Contact the Missouri Secretary of State's Office at (573)-751-4015 or access the documents at:

<http://mosl.sos.state.mo.us/csr/10csr.htm10-25>

Code of Federal Regulations:

Contact the Government Printing Office at (202)-512-1803 or access the documents at:

<http://www.access.gpo.gov/nara/cfr/cfr-table-search.html>

Step 1 for STORM WATER



The federal **Clean Water Act** also regulates STORM WATER runoff (Rain) that has been in contact with industrial storage materials, wastes, loading docks, and other potential sources of chemical contamination. However, when companies protect these things from rain (storm water), they are exempt from regulation. Regulation and management of storm water discharge falls under National Pollutant Discharge Elimination System (NPDES) requirements of the Missouri Department of Natural Resources (MODNR) Water Pollution Control Program at (573)-751-1300.

☐ Your current status...

NOTE: Printers discharging to the Metropolitan St. Louis Sewer District (MSD), or other local sewer authority, may be exempt from the Missouri Department of Natural Resources (MODNR) storm water requirements. If you have any questions, please call your PrintSTEP Coordinator, Bill Hernlund, at 314-301-7600.

All industrial facilities that discharge storm water containing pollutants to waters of the State of Missouri must apply for a National Pollutant Discharge Elimination System (NPDES) permit. However, a permit may not be required at facilities that can certify a "no exposure" condition is maintained. **"No exposure" exists when all industrial materials or activities, including, but not limited to, material handling equipment, industrial machinery, raw materials, intermediate products, by-products or waste products, however packaged, are protected by a storm-resistant shelter to avoid exposure to rain, snow, snowmelt, or runoff.** Adequately maintained mobile equipment (e.g., trucks, automobiles, trailers, that are not leaking contaminants, like gasoline or oil, or are not otherwise a source of industrial pollutants) may be exposed to precipitation or runoff without requiring a permit.

If contaminated storm water is discharged to a public sewer, such as MSD, the local sewer authority must be notified and a discharge permit obtained. The PrintSTEP Coordinator, Bill Hernlund, can help you with this notice. A General NPDES Permit is not necessary if all storm water is discharged to the public sewer.

Step 1 for STORM WATER

Storm Water Exposure Checklist

Use the following checklist to determine if a "no exposure" condition exists at your facility. Circle "Yes" or "No" as appropriate to describe conditions at your facility. If you answer "Yes" to any of the questions, a potential for exposure exists at your site and you cannot immediately certify that a no-exposure condition exists:

Are any of the following items exposed to precipitation, now or in the foreseeable future - AND - is the drainage from these areas discharged from the facility to surface waters of the state instead of a municipal sewer system, such as MSD?

a. vehicles used in material handling (excepting adequately maintained mobile equipment).	Y or N
b. industrial machinery or equipment	Y or N
c. residue from the cleaning of machinery or equipment	Y or N
d. materials associated with vehicular maintenance, cleaning, or refueling	Y or N
e. materials or products during loading/unloading or transporting activities	Y or N
f. materials or products at uncovered loading docks	Y or N
g. materials or products stored outdoors (except for products intended for outdoor use, e.g., cars)	Y or N
h. materials or products handled/stored on roads or railways owned or maintained by the certifier	Y or N
i. materials or spill/leak residues accumulated in storm water inlets	Y or N
j. residuals on the ground from spills/leaks (including subsurface residuals from percolation)	Y or N
k. materials contained in open or deteriorated storage tanks/drums/containers	Y or N
l. industrial activities conducted outdoors	Y or N
m. materials or products from past outdoor industrial activity	Y or N
n. waste material	Y or N
o. process wastewater disposed of outdoors (unless otherwise permitted)	Y or N
p. particulate matter from roof stack/vents not otherwise regulated (i.e., under air quality control permit) and in quantities detectable in the storm water outflow	Y or N
q. visible deposits of residuals near roof or side vents	Y or N
r. spills/leaks resulting from maintenance of stacks or air exhaust systems	Y or N

Step 1 for STORM WATER

Check one:	Your STORM WATER is:
<input type="checkbox"/>	a No exposure condition exists, or you are otherwise exempt from regulation if you checked “No” to all questions
<input type="checkbox"/>	regulated by a NPDES general permit for storm water discharge if you checked “Yes” to any questions

✓ Your Requirements....

Prior to applying for the PrintSTEP Program, each facility must have a current Missouri Department of Natural Resources (MODNR) storm water General NPDES permit, permit application, or be discharging storm water to a local public sewer authority, such as the Metropolitan St. Louis Sewer District (MSD). The MODNR will incorporate your current applicable permits or permit applications into the PrintSTEP Agreement. The conditions specified in the local ordinances and permits, including fees, will be maintained throughout the PrintSTEP pilot program.

Each facility shall operate within the standards specified by their current General NPDES and local sewer authority storm water ordinances, permits and fees, where applicable, and the standards specified by federal, state and local laws, regulations and ordinances. Copies of the relevant sections of MODNR Regulation 10 CSR 20-6&7 and Metropolitan St. Louis Sewer District Ordinance 8472.

If you are exempt from storm water regulations, you must:

Public Participation

- ✓ There are no public participation requirements for Exempt Storm Water facilities that also qualify for PrintSTEP Notification status for wastewater, hazardous waste and air emissions. Please refer to Step 4 for details.

Modifications

- ✓ If your wastewater permit status changes while operating under a PrintSTEP Agreement, it will be necessary to notify the PrintSTEP Coordinator, Bill Hernlund. Please refer to Chapter 2 of the *Missouri PrintSTEP Plain Language Workbook* for guidance on updating your PrintSTEP Agreement.

Step 1 for STORM WATER

If you require a NPDES general permit for storm water:

The conditions of MODNR NPDES Stormwater General Rule Permit Number MO-R130000, “***Storm water discharges from textile and apparel products operations or printing and publishing operations***” will be incorporated into the PrintSTEP Agreement as follows:

Applicability

1. This General NPDES Permit authorizes the discharge of storm water runoff from printing operations to waters of the State of Missouri, including, but not limited to, Standard Industrial Code (SIC) 27xx, Publishing and Allied Industries. This permit does not apply to facilities with SIC Code 2796, Platemaking, which may be covered under a different general permit.
2. This General NPDES Permit applies to facilities with significant activities and materials exposed to storm water. Examples include those facilities with discharges from industrial plants yards, material handling sites, the application of any water that comes into contact with raw materials, finished products or wastes and those areas where industrial activity took place in the past, leaving significant remaining materials exposed to storm water.
3. Sites used for residual treatment, storage or disposal are not included in this permit.
4. If, at any time, the Missouri Department of Natural Resources determines that requiring the owner/operator of the site to apply for a specific permit may better protect the quality of waters of the state, the department may do so.
5. If, at any time, the PrintSTEP Printer should desire to apply for a site-specific permit, they may do so.
6. This General NPDES Permit is not transferable.
7. This General NPDES Permit only pertains to the discharge of storm water.

Exemptions

Facilities that discharge storm water runoff directly to a combined sewer system are exempt from storm water permit requirements.

Requirements

Note: These requirements do not supersede nor remove liability for compliance with the Metropolitan St. Louis Sewer District (MSD), city, county or other local sewer authority and municipal ordinances.

Step 1 for STORM WATER

1. The discharge of storm water from these facilities shall not cause a violation of the state water quality standards, 10 CSR 20-7.031, which states that no water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
 - a. Waters shall be free from substances in sufficient amounts to cause the formation or putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
 - b. Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses.
 - c. Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.
 - d. Waters shall be free from substances or conditions in sufficient amounts to have a harmful effect on human, animal or aquatic life.
 - e. There shall be no significant human health hazard from incidental contact with the water.
 - f. There shall be no acute toxicity to livestock or wildlife watering.
 - g. Waters shall be free from physical, chemical or hydrological changes that would impair the natural biological community.
 - h. Waters shall be free from debris and solid wastes, as defined in RSMo §260.200.
2. All paint, solvents, petroleum products (except fuels), shall be stored so that these materials are not exposed to storm water.
3. Collection facilities shall be provided on site and arrangement made for the proper disposal of waste products.
4. Good housekeeping practices shall be maintained on the site to keep wastes from entering the waters of the state.
5. All fueling facilities present on the site shall adhere to applicable federal and state regulations concerning above and underground storage, including spill prevention, control and counter measures.
6. A storm water pollution prevention plan shall be developed within 180 days, and implemented within 360 days, of receipt of this permit. The plan should be developed in accordance with US EPA guidance manual, *Storm Water Management for Industrial Activities*, EPA 832-R-92-006, 9/1992.
7. An individual shall be designated by the PrintSTEP Printer as responsible for environmental matters.

Sampling Requirements

The department may require sampling and reporting as a result of illegal discharges, compliance issues, complaint investigations, or other such evidence of off-site contamination of pollutants to the waters of the state.

Step 1 for STORM WATER

Termination of the General NPDES Permit

The General NPDES Permit is incorporated into the PrintSTEP Agreement. The permit portion of the Agreement may be terminated when the covered activities have ceased and no significant materials are stored in such a way as to come into contact with the storm water, or if transfer of ownership of the facility and its activities has been made. The PrintSTEP Printer may apply for termination by submitting MODNR Form H, *Termination of a General Permit* to the PrintSTEP Coordinator, Bill Hernlund.

Monitoring

- ✓ Conduct quarterly (January - March, April - May, June - August, September - December) visual examinations of a storm water discharge from each outfall. The inspection must be of a grab sample collected from each outfall. Samples must be collected within the first hour when the runoff begins discharging. The examination of the sample must be conducted in a well lit area and shall include any observations of color, odor, turbidity, floating solids, foam, oil sheen, or other obvious indicators of storm water pollution.

Pollution Prevention Plan

- ✓ Maintain a pollution plan on site with a description of potential pollutant sources including:
 - site map,
 - inventory of exposed materials,
 - significant spills and leaks,
 - non-storm water discharges,
 - sampling data and
 - summary of potential pollutant sources.
- ✓ Select, describe and evaluate the P2 measures, Better Business Practices (BMPs), and other controls that will be implemented at the facility. Source reduction includes preventive maintenance, spill prevention, good housekeeping, training, and material management. If source reduction is not an option include BMPs such as material coverings, water diversion and dust control. If neither is available, then recycling or waste treatment are other alternatives. P2 plans must discuss reasons for selecting control or practice and how each will be addressed at the facility. Measures and controls must address the following:

Step 1 for STORM WATER

- good housekeeping,
- preventive maintenance,
- spill prevention and response procedures,
- inspections,
- employee training,
- record keeping and internal reporting procedures,
- summary of potential pollutant sources and
- management of storm water runoff.

Reporting & Record Keeping

- ✓ A PrintSTEP Annual Report will be required to be submitted to the PrintSTEP Coordinator, Bill Hernlund, describing your facility's emissions and wastes and updating information as necessary.
- ✓ Report and maintain the records of sampling and analyses as specified in General Rule Permit Number MO-R130000, *Storm water discharges from textile and apparel products operations or printing and publishing operations*.
- ✓ Retain the sample analysis, observation and comprehensive site compliance evaluation reports for three (3) years.
- ✓ Maintain records on site for the P2 evaluation plan.

Public Participation

- ✓ There are no public participation requirements for facilities with current General NPDES Permits, who also qualify for PrintSTEP Notification status for wastewater, hazardous waste and air emissions. Please refer to Step 4 for details.

Modifications

- ✓ Call your PrintSTEP Coordinator, Bill Hernlund, at (314)-301-7600 to discuss changes in your process that may modify your PrintSTEP Agreement. Please also refer to Chapter 2 of the *Missouri PrintSTEP Plain Language Workbook* for guidance.

Step 1 for AIR EMISSIONS



The **CLEAN AIR ACT** (CAA) is the federal law which regulates air emissions from both stationary (e.g., factories) and mobile (e.g., vehicles) sources. Among other things, this law authorized the EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment. Regulations written to achieve NAAQS require that industrial facilities limit the amount of certain chemicals that they release to the air. For printers, the relevant regulations typically relate to volatile organic compounds (VOCs). VOC emissions lead to the formation of ground-level ozone or smog. Printers that release VOCs may be required to meet emissions limits, and/or have certain pollution control equipment, as required by their state. The CAA also requires EPA to set limits on selected hazardous air pollutants, or HAPs. See Appendix C for a list of HAPs.

☐ Your current status...

For air emissions, **PrintSTEP has 5 “Air Levels”**. Your facility’s PrintSTEP Air Level depends on your VOC and HAP emissions, and the air quality in the Region of the Missouri Department of Natural Resources (MODNR) where your facility is located. You can choose one of two methods to determine your PrintSTEP Air Level:

- ☛ The **Materials Use** method presented in this section is a simple method that allows you to estimate your PrintSTEP Air Level, based on the quantities of materials you use that may contain VOCs and HAPs.
- ☛ The **Emissions Calculations** method presented in Appendix B allows you to calculate your air emissions more precisely and account for your efforts to reduce emissions, such as emissions control equipment. If you have such equipment and want credit for it in determining your Air Level, you must use the Emissions Calculations method in Appendix B.

NOTE!! If you use more than one type of printing process in your facility, you cannot use the **Materials Use Method** to determine your PrintSTEP Air Level. You must use the Emissions Calculations method in Appendix B. For example, if you have a flexographic press with water-based inks and a sheet-fed offset lithographic press, you are using 2 printing processes and cannot use the Materials Use Method.

Step 1 for AIR EMISSIONS

By using the Materials Use Worksheet provided, you can determine your facility's PrintSTEP Air Level based on the quantities of materials you use. All you need to know is your facility's material usage for the last 12 months. By assuming that your air emissions result from using the materials identified on the Worksheet, the Materials Use method translates material use into air emissions and your corresponding PrintSTEP Air Level. Therefore, this approach allows you to assess your facility's air emissions without doing complex calculations. See Appendix A for more detailed information on the Materials Use method.

NOTE: If your facility has a Clean Air Act Title V (Part 70) operating permit, you are automatically in PrintSTEP Air Level 5.

Instructions for determining your PrintSTEP Air Level

- ▶ Review the Materials Use Worksheet on the following pages. Find the section for your printing process in Column 1. Column 2 lists the VOC-containing materials that you will have to track. For the materials listed in Column 2, gather the following information:
 - ☛ records of materials used (e.g., purchasing and inventory records) within the past 12 months and
 - ☛ material safety data sheets (MSDSs) and product data sheets for materials used at your facility.
- ▶ Complete the Materials Use Worksheet with the materials listed in Column 2 that you used in the last 12 months. Only fill in the portion that applies to your printing processes. Detailed instructions follow the Materials Use Worksheet and there is an example Materials Use Worksheet in Appendix A.

NOTE!! If you use more than one type of printing process in your facility, you cannot use the Materials Use Method to determine your PrintSTEP Air Level. You must use the Emissions Calculations method in Appendix B. For example, if you have a flexographic press with water-based inks and a sheet-fed offset lithographic press, you are using 2 printing processes and cannot use the Materials Use Method.

Step 1 for AIR EMISSIONS

Materials Use Worksheet

①	②	③	④	⑤	⑥	⑦
Printing Process	VOC-containing Materials	Qty VOC-containing materials used in the last 12 mo.	Name of HAP present in material, if any	If the material has HAPs, copy Qty here	✓ if HAP previously listed	Cumulative Sum of Each HAP
Sheetfed or Non-heatset Web Lithography (No pollution control)	cleaning solvents	gals				
		gals				
		gals				
	fountain soln additives	gals				
		gals				
	adhesives & coatings	gals				
		gals				
		gals				

OR

Screen Printing (No pollution control)	solvent-based inks	gals				
		gals				
		gals				
	dilution & cleaning solvents	gals				
		gals				
		gals				
	adhesives & coatings	gals				
		gals				
	VOC Total		HAP Total			

Step 1 for AIR EMISSIONS

Materials Use Worksheet

①	②	③	④	⑤	⑥	⑦
Printing Process	VOC-containing Materials	Qty VOC-containing materials used in the last 12 mo.	Name of HAP present in material, if any	If the material has HAPs, copy Qty here	✓ if HAP previously listed	Cumulative Sum of Each HAP
Heatset Web Offset lithography (No pollution control)	inks	lbs				
		lbs				
		lbs				
	cleaning solvents	lbs				
		lbs				
	fountain soln additives	lbs				
		lbs				
	adhesives & coatings	lbs				

OR

Flexography or Rotogravure with water-based inks (No pollution control)	water-based inks*	lbs				
		lbs				
		lbs				
	water-based coatings*	lbs				
		lbs				
		lbs				
	water-based adhesives*	lbs				
		lbs				
		lbs				

*If your water-based materials contain more than 25% of the volatile fraction as VOC, you must use the AFlexography or Rotogravure with Solvent Inks® section below.

OR

Flexography or Rotogravure with water-based inks (No pollution control)	inks	lbs				
		lbs				
		lbs				
	dilution & cleaning solvents	lbs				
		lbs				
		lbs				
	adhesives & coatings	lbs				
		lbs				

VOC Total

HAP Total

Step 1 for AIR EMISSIONS

Materials Use Worksheet Instructions (see Appendix A for an example)

COLUMN 1: Fill out the section of the Worksheet for the printing process at your facility only.

NOTE!! This Materials Use Worksheet is based on the assumption that 90% or more of the VOCs and HAPs in your facility come from the **listed type of printing processes**. If you have another type of printing process in your facility that uses materials that constitute more than 10% of your VOCs or HAPs, you cannot use this Materials Use Worksheet. Please use the Emissions Calculations Worksheet in Appendix B.

COLUMN 2: The listed types of materials are those that generate most of the VOC and HAP emissions from the listed type of printing process. You do not need to include a listed type of material if you used less than 25 gallons of that type of material in the past 12 months. For example, if you used 1 gallon each of 30 different inks, your total use of this type of material (i.e., ink) would be more than 25 gallons and you would have to include it on your Worksheet.

NOTE!! This Materials Use Worksheet is ALSO based on the assumption that 90% or more of the VOCs and HAPs in your facility come from the **listed types of materials**. If you use other materials in your facility that constitute more than 10% of your VOCs or HAPs, you will not be able to use this Materials Use Worksheet. Please use the Emissions Calculations Worksheet in Appendix B.

COLUMN 3: For each type of material listed in Column 2, list the total quantity used in the last 12 months. Enter the total quantity of the material used regardless of the percentage content of VOCs. Be sure to enter the quantities **ONLY** in the units specified on the Worksheet. For example, screen printers will enter quantities in gallons only. If you need to convert a material quantity from gallons to pounds, multiply by the density of the material. If you need to convert from pounds to gallons, divide by the density.

Step 1 for AIR EMISSIONS

NOTE!! This Materials Use Worksheet does NOT count emissions reductions resulting from pollution control equipment or hazardous waste disposal. **If you have pollution control devices, or reduce VOC/HAPs with hazardous waste disposal, and want credit for the resulting emissions reductions** when determining your Air Level, you must use the Emissions Calculations Worksheet in Appendix B.

COLUMN 4: For each material, determine what HAPs it contains, if any. To do this, look at the chemical ingredients listed on the product data sheets for each material, verify these with the supplier, and compare them with the list of HAPs in Appendix C. Record the name of each HAP in each material you use. Columns 5, 6, and 7 are for tracking your HAPs. If the material does not contain any HAPs, go on to the next material.

COLUMN 5: For those materials that do contain HAPs, copy the quantity used from Column 3 to Column 5. You're just copying over the same number, but it provides an easy way to add up your HAP-containing materials at the end. Again, you're entering total quantity of the material used; not just the HAP-containing portion. If the material contains more than one HAP, only enter the quantity in Column 5 once per material used.

COLUMN 6: For this column, look at your previous entries in Column 4. Compare the HAPs you listed for the material you are now entering to the names of the HAPs you listed in previous rows. If it is a repeat, put a \checkmark in Column 6. If it has not been listed, leave Column 6 blank.

COLUMN 7: In this column you will keep a running total of quantity of materials used containing any one kind of HAP. For example, if you do not have a repeat HAP, copy over the quantity used from Column 3 to Column 7. However, if the HAP has been listed before, add the quantity used of the material you're entering now to any previously recorded quantities that contain that same HAP. To avoid double counting at the end, go back to the previous entry of the repeat HAP and put a line through it (see Appendix A for an example).

Step 1 for AIR EMISSIONS

✓ After completing the Materials Use Worksheet, determine your Air Level

- ▶ Add up the pounds or gallons of VOC-containing material used (Column 3). Enter this total at the bottom of the Worksheet in the box labeled “VOC Total”.
- ▶ Add up the pounds or gallons of HAP-containing materials used (Column 5). This is your total use of HAP-containing material. Enter this total at the bottom of the Worksheet in the box labeled “HAP Total”.
- ▶ Now use the Materials Use Worksheet totals to determine your PrintSTEP Air Level.

1. Volatile Organic Compounds (VOCs)

Determine your Air Level based on your use of **VOC**-containing materials.

Using the appropriate Materials Use Air Level Table below, find the Level associated with the total VOC-containing material you used, as recorded in the “VOC Total” box. Use the table corresponding to your facility’s location. Your Level depends on both what type of printing process you use and where you are located. Write that Air Level in Box 1.

If your facility is located in the St. Louis Region (City of St. Louis or St. Louis, Jefferson, St. Charles, Lincoln, Warren or Franklin Counties), use the table on the following page to determine your PrintSTEP VOC Air Level:

Step 1 for AIR EMISSIONS

Material Use Air Level Table for VOCs – St. Louis Region

Sheetfed Offset or Nonheatset Web Lithography, or Screen Printing	Heatset Web Offset Lithography, or Flexography or Rotogravure with solvent-based inks	Flexography or Rotogravure with water-based inks*	Air Level
less than 2,855 gals	less than 20,000 lbs	less than 80,000 lbs	→ Level 1
2,855 – 7,135 gals	20,000 – 50,000 lbs	80,000 – 200,000 lbs	→ Level 2
7,135 – 14,275 gals	50,000 – 100,000 lbs	200,000 – 400,000 lbs	→ Level 3
14,275 – 28,550 gals	100,000 – 200,000 lbs	400,000 – 800,000 lbs	→ Level 4
more than 28,550 gals	more than 200,000 lbs	more than 800,000 lbs	→ Level 5

* A water-based ink contains no more than 25% of the volatile fraction as VOCs.

This is your Air Level based on VOCs

➤➤ 1.

2. Hazardous Air Pollutants (HAPs)

Next, check your Air Level based on your use of **HAP**- containing materials.

Use the Material Use Air Level Table for HAPs below to find the Level associated with the quantity of HAP-containing material you used. Depending on your printing process, you will use either the left side or the right side of the Table. There are two different numbers to check to determine your PrintSTEP Air Level based on HAPs:

- Compare your **TOTAL HAP**-containing materials, as recorded in the “HAP Total” box on the Worksheet, to the limits in the Table below. Find your Air Level based on your TOTAL HAPs.
- Then look over the sums for each individual HAP you listed in Column 7 of the Worksheet. Compare the highest quantity of any **SINGLE HAP** used to the limits in the Table below. Find your Air Level based on your SINGLE HAP use.

Step 1 for AIR EMISSIONS

Material Use Air Level Table for HAPs

Sheetfed Offset or Nonheatset Web Lithography, or Screen Printing		Air Level		Heatset Web Offset Lithography, or Flexography or Rotogravure	
TOTAL HAP-containing materials	Sum of materials containing any SINGLE HAP:			TOTAL HAP-containing materials	Sum of materials containing any SINGLE HAP:
less than 3,333 gals	less than 1,334 gals	→ Level 1	←	less than 25,000 lbs	less than 10,000 lbs
3,333 - 6,667 gals	1,334 - 2,667 gals	→ Level 3	←	25,000 - 50,000 lbs	10,000 - 20,000 lbs
more than 6,667 gals	more than 2,667 gals	→ Level 5	←	more than 50,000 lbs	more than 20,000 lbs

This is your Air Level based on Total HAPs

➤➤ 2a.

This is your Air Level based on a Single HAP

➤➤ 2b.

- Compare the two Air Levels based on HAP-containing materials. Enter the higher number in Box 2c:

This is your Air Level based on HAPs

➤➤ 2c.

- Compare the numbers in Boxes 1 & 2c. Write the highest number in Box 3.

This is your final PrintSTEP Air Level.

➤➤ 3.

Record it in the Table on the next page ➤➤➤

Step 1 for AIR EMISSIONS

PrintSTEP Air Level

Check one:	Your final PrintSTEP AIR LEVEL is:
<input type="checkbox"/>	Air Level 1
<input type="checkbox"/>	Air Level 2
<input type="checkbox"/>	Air Level 3
<input type="checkbox"/>	Air Level 4
<input type="checkbox"/>	Air Level 5

✓Your Requirements....

The Missouri Department of Natural Resources (MODNR) will incorporate your current applicable Air Pollution Control Program and local environmental authority permits, or permit applications into the PrintSTEP Agreement. The conditions specified in the local ordinances and permits, including fees, will be maintained throughout the PrintSTEP pilot program.

Each facility shall operate within the standards specified by their current local air permits, including fees, where applicable, and operate within the air quality standards specified by current federal, state and local laws, regulations and ordinances. Please refer to the relevant sections of Missouri Department of Natural Resources 10 CSR 10-5 & 6, the City of St. Louis Ordinance 64749 or St. Louis County Ordinance Chapter 612, where applicable.
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Step 1 for AIR EMISSIONS

If you are in AIR LEVEL 1, you must: (NOTE: Facilities operating at Air Levels 2, 3, 4 and 5 are also required to maintain these requirements)

NOTE!!

- Many Air Level 1 facilities will be basic sources as a practical matter with potential to emit less than the Major Source Threshold (MST) for VOC and HAP and do not need enforceable conditions to limit their potential to emit. The annual report on VOC and HAP emissions for Air Level 1 facilities is for the purpose of confirming that they are operating within the thresholds for Air Level 1, not for purposes of limiting their potential to emit.
- Many facilities in Air Level 1 will not have air pollution control equipment. If a facility has air pollution control equipment, and the facility wants to take the performance of this equipment into consideration to qualify for PrintSTEP Air Level 1, then the MODNR may place practically enforceable conditions in effect regarding the control equipment's contribution to meet the Air Level 1 thresholds.
- The Air Level 1 requirements templates in this workbook assume that Air Level 1 facilities are basic sources for VOCs and HAPs. If the facility's existing air permits with the MODNR, city and/or county establishes their current operations to qualify within PrintSTEP Air Level 1 through the use of air pollution control equipment, then additional conditions must be added to the Air Level 1 requirements.

Materials Management

- ✓ Complete the Air Level Worksheet (using either the Materials Use or Emissions Calculations Method) annually to assure that emissions do not exceed PrintSTEP Air Level 1 thresholds for VOCs or HAPs.

Monitoring/Testing

- ✓ The monitoring and testing requirements of the current permits (if required), including annual consumption, shall be maintained in order to assure compliance with daily emission limits.
- ✓ When counting facility emissions (mass per time), use the features specified below, as per the emission calculations in Appendix B of the *Missouri PrintSTEP Plain Language Workbook*:
 - 95% ink oil retention for non-heatset sheetfed and web offset lithographic inks,
 - 20% ink oil retention for heatset web offset lithographic inks,
 - 70% carryover of alcohol substitute fountain solution additive dryer for heatset web lithographic presses,
 - 40% carryover of low vapor pressure (< 10mm Hg) automatic blanket wash to dryer for lithographic printing and
 - 50% retention of low vapor pressure (< 10mm Hg) cleaning solvent in shop towels for lithographic printing, as long as used towels are kept in closed containers.

Step 1 for AIR EMISSIONS

Record Keeping

- ✓ Keep completed Air Level Worksheets on file.
- ✓ Keep annual materials usage records sufficient to demonstrate that the facility emissions qualify as Air Level 1. This includes records of quantities of the materials listed on the Air Level Worksheets, such as inks, cleanup solutions, fountain solution additives, coatings, and adhesives.
- ✓ Keep Material Safety Data Sheets (MSDSs) and product data sheets on file for materials used.
- ✓ Maintain all records for 5 years.

Reporting

- ✓ The PrintSTEP Application for Air Level 1 may serve as a one-time notice of emissions, wastes, and releases with no further reporting, if the wastewater, storm water and hazardous waste requirements are also at minimal emissions levels.
- ✓ The monitoring and testing requirements of the current permits shall be maintained.

Standard Conditions

- ✓ The facility must comply with all PrintSTEP requirements.
- ✓ The facility must properly operate and maintain the facility.
- ✓ The permitting authority can still inspect the facility.
- ✓ The responsible person must sign reports.
- ✓ The facility must provide information upon request.
- ✓ The need to halt or reduce activity is not defense from enforcement.

Modifications

- ✓ If your air emissions, materials usage or air volumes change significantly, call your PrintSTEP Coordinator, Bill Hernlund, at (314)-301-7600 to discuss modifications to your PrintSTEP Agreement. Please also refer to Chapter 2 of the *Missouri PrintSTEP Plain Language Workbook* for guidance.
- ✓ Note: If your facility shuts down permanently during the PrintSTEP pilot program, other requirements may apply.

Public Participation

- ✓ There are no public participation requirements for Air Level 1 facilities that also qualify for PrintSTEP Notification status for wastewater, storm water and hazardous waste. Please refer to Step 4 for details.

Step 1 for AIR EMISSIONS

If you are in AIR LEVEL 2, you must meet the following requirements, plus the applicable requirements for Air Level 1:

NOTE!!

- Many Air Level 2 facilities will be basic sources as a practical matter with potential to emit less than the Major Source Threshold (MST) for VOC and HAP and do not need practically enforceable conditions to limit their potential to emit. The annual report on VOC and HAP emissions for Air Level 2 facilities is for the purpose of confirming that they are operating within the thresholds for Air Level 2, not for purposes of limiting their potential to emit.
- Most facilities in Air Level 2 will not have air pollution control equipment. If a facility has air pollution control equipment, and the facility wants to take the performance of this equipment into consideration to qualify for PrintSTEP Air Level 2, then the MODNR may place practically enforceable conditions in effect regarding the control equipment's contribution to meet the Air Level 2 thresholds.
- The Air Level 2 requirements template below assumes that Air Level 2 facilities will be basic sources for VOCs and HAPs. The MODNR must add conditions, as described above, to the Air Level 2 requirements to address Air Level 2 facilities that are intermediate sources.

Materials Management

- ✓ Complete the Air Level Worksheet (using either the Materials Use or Emissions Calculations Method) annually to assure that emissions do not exceed PrintSTEP Air Level 2 thresholds.

Monitoring/Testing

- ✓ The monitoring and testing requirements of the current permits (if required), including annual consumption, shall be maintained in order to assure compliance with daily emission limits.
- ✓ When counting facility emissions (mass per time), use the features specified below, as per the emission calculations in Appendix B of the *Missouri PrintSTEP Plain Language Workbook*:
 - 95% ink oil retention for non-heatset sheetfed and web offset lithographic inks,
 - 20% ink oil retention for heatset web offset lithographic inks,
 - 70% carryover of alcohol substitute fountain solution additive dryer for heatset web lithographic presses,
 - 40% carryover of low vapor pressure (< 10mm Hg) automatic blanket wash to dryer for lithographic printing and
 - 50% retention of low vapor pressure (< 10mm Hg) cleaning solvent in shop towels for lithographic printing, as long as used towels are kept in closed containers.

Step 1 for AIR EMISSIONS

Record Keeping

- ✓ Keep completed Air Level Worksheets on file.
- ✓ Keep annual materials usage records sufficient to demonstrate that the facility emissions do not exceed Air Level 2 thresholds. This includes records of quantities of the materials listed on the Air Level Worksheets, such as inks, cleanup solutions, fountain solution additives, coatings, and adhesives.
- ✓ Keep Material Safety Data Sheets (MSDSs) and product data sheets on file for materials used.
- ✓ Maintain all records for five years.

Reporting

- ✓ PrintSTEP annual reports must be submitted to document compliance with Air Level 2 thresholds. The report must also describe changes in facility operations that have impacted the emissions (either increases or decreases).
- ✓ The Missouri Department of Natural Resources (MODNR) will add any facility-specific reporting requirements (e.g., for a RACT or NSPS rule) to the PrintSTEP Agreement.
- ✓ Please send the annual material use report to the PrintSTEP Coordinator by the anniversary date of the PrintSTEP Agreement. This only needs to be done once annually for Air Level 2 facilities, not on a rolling monthly basis.

Standard Conditions

- ✓ The facility must comply with the requirements of the PrintSTEP Agreement.
- ✓ Please refer to Air Level 1.

Modifications

- ✓ If you make modifications to your facility which do not increase your PrintSTEP Air Level, or do not add a new printing process or pollution control equipment, then just describe the change in the PrintSTEP Annual report.
- ✓ If you make modifications to your facility which increase your PrintSTEP Air Level or include a new printing process or pollution control equipment, then a modification to the PrintSTEP Agreement may be required. You can modify the Agreement by contacting your PrintSTEP Coordinator, Bill Hernlund, at (314)-301-7600. Please refer to Chapter 2 of the *Missouri PrintSTEP Plain Language Workbook* for guidance on updating your PrintSTEP Agreement.

Public Participation

- ✓ A printer that qualifies for Air Level 2 must meet, at a minimum, the Limited Public Participation requirements of PrintSTEP (please see Step 4 of Chapter 1 for a description of these requirements). Your ultimate public participation requirements will depend on your status with regard to air emissions, hazardous waste, storm water and wastewater.

Step 1 for AIR EMISSIONS

If you are in AIR LEVEL 3, you must meet the following requirements, plus the applicable requirements for Air Levels 1 and 2:

NOTE!! Facilities in Air Level 3 will have practically enforceable limitations included in the PrintSTEP Agreement which exist in the current Construction and Operating permits.

Materials Management

- ✓ Complete the Air Level Worksheet (using either the Materials Use or Emissions Calculations Method) annually to assure that emissions do not exceed PrintSTEP Air Level 3 thresholds.

Monitoring/Testing

- ✓ The monitoring and testing requirements of the current permits (if required), including annual consumption, shall be maintained in order to assure compliance with daily emission limits. Please refer to Air Level 1.
- ✓ When counting facility emissions (mass per time), use the features specified below, as per the emission calculations in Appendix B of the *Missouri PrintSTEP Plain Language Workbook*:
 - 95% ink oil retention for non-heatset sheetfed and web offset lithographic inks,
 - 20% ink oil retention for heatset web offset lithographic inks,
 - 70% carryover of alcohol substitute fountain solution additive dryer for heatset web lithographic presses,
 - 40% carryover of low vapor pressure (< 10mm Hg) automatic blanket wash to dryer for lithographic printing and
 - 50% retention of low vapor pressure (< 10mm Hg) cleaning solvent in shop towels for lithographic printing, as long as used towels are kept in closed containers.

Record Keeping

- ✓ Keep materials usage records on a rolling 12-month basis sufficient to demonstrate that the facility emissions do not exceed Air Level 3 thresholds. This includes records of quantities of the materials listed on the Air Level Worksheets, such as inks, cleanup solutions, fountain solution additives, coatings, and adhesives. For facilities using the Emissions Calculations Method, materials content information must be maintained.

Reporting

- ✓ An annual report must be submitted which documents compliance with Air Level 3 thresholds. The report must also describe changes in facility operations that impacted emissions (increases or decreases).
- ✓ Please send an annualized summary of the rolling monthly material use reports to the PrintSTEP Coordinator by the anniversary date of the PrintSTEP Agreement.

Step 1 for AIR EMISSIONS

Modifications

- ✓ If you make modifications to your facility which do not increase your PrintSTEP Air Level, or do not add a new printing process or pollution control equipment, then just describe the change in the PrintSTEP Annual report.
- ✓ If you make modifications to your facility which increase your PrintSTEP Air Level or include a new printing process or pollution control equipment, then you can modify the Agreement by contacting your PrintSTEP Coordinator, Bill Hernlund, at (314)-301-7600. Please refer to Chapter 2 of the *Missouri PrintSTEP Plain Language Workbook* for guidance on updating your PrintSTEP Agreement.

Public Participation

- ✓ Printers that qualify for Air Level 3 must meet, at a minimum, the Limited Public Participation requirements of PrintSTEP (please see Step 4 of Chapter 1 for a description of these requirements). Your public participation requirements will also depend on your status with regard to air emissions, hazardous waste, storm water and wastewater.

Step 1 for AIR EMISSIONS

If you are in AIR LEVEL 4, you must meet the following requirements, plus the applicable requirements for Air Levels 1, 2 and 3:

NOTE!!

- Facilities in Air Level 4 will have practically enforceable limitations included in the PrintSTEP Agreement which exist in the current Construction and Operating permits.
- The present practically enforceable limitations for existing construction and operating permits, as well as pending permit modifications and applications, will be made part of the PrintSTEP Agreement.

Materials Management

- ✓ Specifying the individual requirements that apply to each Air Level 4 facility are part of the PrintSTEP Agreement. These requirements, as are appropriate to the operations at each individual facility, will contain a combination of the possibilities in the example below:

Possible Requirements	that can apply to:	that can have a frequency of:	that can be required in units of:
<ul style="list-style-type: none"> • Limitations on inks, coatings and other materials applied on presses • Limits on cleaning solvents (e.g., blanket washes and screen reclamation chemicals) • Performance requirements for add-on controls (capture systems and control devices, or overall control) 	<ul style="list-style-type: none"> • Individual materials • Groups of materials • All materials used at the facility • All presses • Groups of presses • Individual presses • Individual units on presses 	<ul style="list-style-type: none"> • Instantaneous • Daily • Weekly • Monthly • 12 month rolling • Annual (limited application) 	<ul style="list-style-type: none"> • Emission rates of pollutant contents (lb/gal, lb/lb, vapor pressure) • Mass emissions per unit time (lb/day, lb/month) • Duplication in limits should be avoided

Or- in other words:

- ✓ The PrintSTEP Agreement can express limits for lithographic blanket wash and other cleaning solvents in terms of vapor pressure (e.g., 10 mm Hg @ 20°C)
- ✓ The PrintSTEP Agreement will not include conditions that require that the printer use a particular manufacturer's product. Such conditions are not performance based and limit flexibility.
- ✓ The PrintSTEP Agreement should explicitly specify the extent (time frame, equipment, and materials) to which averaging is allowed for demonstrating compliance.

Step 1 for AIR EMISSIONS

Monitoring/Testing

- ✓ For emissions caps, the source shall assure compliance with total emissions limits based on an approved method of measuring material use and content, production rate, and/or operational parameters for specific emission units.
- ✓ Use Method 24A only for publication rotogravure inks and related publication rotogravure coatings. Use Method 24 for all other inks, coatings, and adhesives.
- ✓ When using Method 24 on waterborne materials, use the precision adjustments when determining compliance of individual materials. When averaging materials or counting total mass emissions, do not adjust below formulation VOC content.
- ✓ For purposes of ink oil capture, do not require heatset web offset printers to perform capture efficiency testing. Instead, require that the dryer be operated at negative pressure.
- ✓ When counting facility emissions (mass per time), use the features specified below, as per the emission calculations in Appendix B of the *Missouri PrintSTEP Plain Language Workbook*:
 - 95% ink oil retention for non-heatset sheetfed and web offset lithographic inks,
 - 20% ink oil retention for heatset web offset lithographic inks,
 - 70% carryover of alcohol substitute fountain solution additive dryer for heatset web lithographic presses,
 - 40% carryover of low vapor pressure (< 10mm Hg) automatic blanket wash to dryer for lithographic printing and
 - 50% retention of low vapor pressure (< 10mm Hg) cleaning solvent in shop towels for lithographic printing, as long as used towels are kept in closed containers.
- ✓ Allow for compliance for equipment using solvent recovery systems (e.g., publication rotogravure press controlled by carbon adsorption) to be demonstrated by liquid-liquid material balance. This directly provides overall control efficiency and eliminates the need for separate tests of capture efficiency and control device efficiency.
- ✓ Results from OAQPS work on testing and monitoring will be incorporated as appropriate (e.g., representative or maximum operating conditions for performance testing, key parameter monitoring in lieu of performance testing).
- ✓ Facilities currently being regulated for additional monitoring and testing requirements will have these requirements specified in the PrintSTEP Agreement.

Record Keeping

- ✓ Keep materials usage records on a rolling 12-month basis sufficient to demonstrate that the facility emissions do not exceed Air Level 4 thresholds. This includes records of quantities of the materials listed on the Air Level Worksheets, such as inks, cleanup solutions, fountain solution additives, coatings, and adhesives. For facilities using the Emissions Calculations, materials content information must be maintained.
- ✓ Please refer to Air Level 1.

Step 1 for AIR EMISSIONS

Reporting

- ✓ The PrintSTEP Annual report must be submitted to document compliance with Air Level 4 thresholds. The report must also describe changes in facility operations that impacted emissions (increases or decreases).
- ✓ Please refer to Air Levels 1, 2 and 3.

Standard Conditions

- ✓ The facility must submit a compliance plan.
- ✓ The applicant must continue to pay fees to the Missouri Department of Natural Resources (MODNR), county, city and municipal agencies.
- ✓ The responsible official shall certify compliance with terms and conditions and report deviation from requirements.
- ✓ The facility must reapply six months prior to the end of the PrintSTEP Agreement term.
- ✓ Please refer to Air Levels 1, 2 and 3.

Modifications

- ✓ If you make modifications in your facility and do not increase or decrease your PrintSTEP Air Level, or do not add a new printing process or pollution control equipment, then you must describe the change in the PrintSTEP Annual report.
- ✓ If the modification increases your PrintSTEP Air Level or includes a new printing process or pollution control equipment, a modifications to the PrintSTEP Agreement may be required. See Chapter 2 of the *Missouri PrintSTEP Plain Language Workbook*, or contact the PrintSTEP Coordinator, for guidance.

Public Participation

- ✓ A printer that qualifies for Air Level 4 must meet, at a minimum, the Full Public Participation requirements of PrintSTEP (please see Step 4 of Chapter 1 for a description of these requirements). Your public participation requirements will also depend on your status with regard to air emissions, hazardous waste, storm water and wastewater.

Step 1 for AIR EMISSIONS

If you are in AIR LEVEL 5, you must meet the following requirements, plus the applicable requirements for Air Level 1,2,3 and 4:

NOTE: If your facility has a Clean Air Act Title-V (Part 70) operating permit, you are automatically in PrintSTEP Air Level 5. The specific operating, monitoring, reporting, record keeping and permitting requirements must be evaluated on a site-by-site basis to assure compliance. Contact the PrintSTEP Coordinator, Bill Hernlund, for assistance to initiate the PrintSTEP Air Level 5 process.

Materials Management

- ✓ Daily NAAQS Protective caps will be maintained.
- ✓ Must meet RACT, NSPS, MACT, BACT, LAER, and NSR requirements.

Monitoring/Testing

- ✓ For daily NAAQS protective cap, the source shall assume compliance with daily emission limits based on an approved emission factor and production and/or operational parameters for specific emission units.
- ✓ Facilities currently being regulated for additional monitoring and testing requirements will have these requirements specified in the PrintSTEP Agreement.

Record Keeping

- ✓ Keep materials usage records on a rolling 12-month basis sufficient to demonstrate that the facility emissions do not exceed the limits specified in your PrintSTEP Agreement. Facilities using the Emissions Calculations method must maintain materials content information.

Reporting

- ✓ Report to the MODNR and applicable local agencies every 6 months. Any other reporting requirements that apply to the facility are part of the PrintSTEP Agreement.
- ✓ An annual report must be submitted by April 1st which documents compliance with the limits specified in your PrintSTEP Agreement. The report must also describe changes in facility operations that impacted emissions (increases or decreases).
- ✓ Report discrepancies within 15 days.

Modifications

- ✓ Modifications that are considered major under NSR require a full NSR and reopening of the PrintSTEP Agreement.
- ✓ See Chapter 2 of the *Missouri PrintSTEP Plain Language Workbook*, or contact the PrintSTEP Coordinator, Bill Hernlund, for guidance to revise the PrintSTEP Agreement if you modify the printing processes or pollution control equipment.

Step 1 for AIR EMISSIONS

Public Participation

- ✓ A printer that qualifies for Air Level 5 must meet, at a minimum, the Full Public Participation requirements of PrintSTEP (please see Step 4 of Chapter 1 for a description of these requirements). Your public participation requirements will also depend on your status with regard to air emissions, hazardous waste, storm water and wastewater.

To obtain copies of the state and federal air pollution control regulations:

Missouri Code of State Regulations:

Contact the Missouri Secretary of State's Office at (573)-751-4015 or access the documents at:

<http://mosl.sos.state.mo.us/csr/10csr.htm10-10>

Code of Federal Regulations:

Contact the Government Printing Office at (202)-512-1803 or access the documents at:

<http://www.access.gpo.gov/nara/cfr/cfr-table-search.html>

Summing up STEP 1

★TIP

Consider future growth.

Keep in mind that your PrintSTEP Notification or Agreement is your commitment for the future.

You must operate your facility within the limits of the PrintSTEP categories on your Application.

These are enforceable limits. If the past 12 months do not accurately represent your operations, or if you are close to the upper limit in a category, you may want to consider using the next higher category on your original Application.

You qualify for a

PRINTSTEP NOTIFICATION if:

- ☐ You discharge process WASTEWATER to a public sewer and are not a Significant Industrial User (SIU) –or-
- ☐ You have no process wastewater discharge.

AND

- ☐ You do not generate HAZARDOUS WASTE or
- ☐ You are a Conditionally Exempt Small Quantity Generator of hazardous waste or
- ☐ You are a Small Quantity Generator of hazardous waste

AND

- ☐ Your STORM WATER is exempt from regulation

AND

- ☐ Your AIR EMISSIONS are PrintSTEP Level 1

You will get a

PRINTSTEP AGREEMENT if:

- ☐ You discharge process WASTEWATER to a public sewer and are designated as an SIU –or-
- ☐ You require an Individual General NPDES Permit for your process wastewater

OR

- ☐ You are a Large Quantity Generator of HAZARDOUS WASTE

OR

- ☐ You require a NPDES General permit for STORM WATER

OR

- ☐ Your AIR EMISSIONS are PrintSTEP Level 2, 3, 4, or 5

STEP 2: SUBMIT YOUR PRINTSTEP APPLICATION

- ☛ Using the wastewater, hazardous waste, storm water, and air emissions worksheets you just checked off, complete the **PrintSTEP Application form in Appendix D**.
- ☛ Remember to consider future growth. For example, if you are currently a Small Quantity Generator but you are very close to being a Large Quantity Generator, you may want to consider putting Large Quantity Generator on your PrintSTEP Application.
- ☛ Send the completed Application to the Missouri Department of Natural Resources (MODNR) to:

Missouri Department of Natural Resources
Attention: Bill Hernlund, PrintSTEP Coordinator
9200 Watson Road, Suite 201
Crestwood, MO 63126-1528

Phone:(314)-301-7600

FAX: (314)-301-7607

Email: nrhernb@mail.dnr.state.mo.us

STEP 3: YOUR APPLICATION IS FILED IN THE PUBLIC INFORMATION REPOSITORY

- ☛ The Missouri Department of Natural Resources (MODNR) will review your Application upon receipt. If there are incomplete sections or errors, the MODNR will contact you for more information.
- ☛ If everything is in order on your Application, the MODNR will file a copy in the **PrintSTEP Public Information Repository**.

PrintSTEP Information Repositories

The public can review copies of the Application that a printer submits to the MODNR (other than confidential business information) through the Public Information Repository. The purpose of the Repository is to help make the PrintSTEP process understandable and accessible to everyone. The Repository also will include copies of all public notices related to PrintSTEP. This Repository will be located at a readily accessible location, such as a local library or town hall. When modifications are made to an Application, the MODNR will update the repository. Call your PrintSTEP Coordinator, Bill Hernlund, at (314)-301-7600 to find out about the Public Information Repository.

- ☛ If you qualify for a PrintSTEP Notification status-



you're now a PrintSTEP printer! As a PrintSTEP participant, you must operate your facility within the thresholds of PrintSTEP Notification status and comply with all requirements. Skip to Chapters 2 through 5 of this Workbook for ideas on how you can make further improvements in your printing facility.

- ☛ If you are applying for a PrintSTEP Agreement, continue with Steps 4 & 5.

STEP 4: THE PUBLIC PARTICIPATES IN PRINTSTEP

This is the Step where the public can get involved in the PrintSTEP process. While PrintSTEP lays out the process for this public participation, ultimately it is up to the public whether or not they choose to get involved. If they do not participate, the process moves forward to Step 5.

In PrintSTEP, the public participation requirements correspond to the potential environmental impact. **Printers that qualify for a PrintSTEP Notification** (those with the lowest emissions or wastes in all media) **do not have requirements for public participation**. However, the Application will be available to the public through **the Public Information Repository**. Those printers with moderate emissions have “Limited Public Participation” requirements. And, printers with the greatest releases have “Full Public Participation” requirements. Determine the Public Participation requirements using the worksheet below.

Public Participation Requirements Worksheet

<i>check your status in each row</i>	NO Public Participation	LIMITED Public Participation	FULL Public Participation
Waste Water	<input type="checkbox"/> Public sewer discharge and not a Significant Industrial User <input type="checkbox"/> no discharge	<input type="checkbox"/> Significant Industrial User	<input type="checkbox"/> NPDES Individual permit
Hazardous Waste	<input type="checkbox"/> Small Quantity Generator <input type="checkbox"/> Conditionally Exempt Small Quantity Generator <input type="checkbox"/> no hazardous waste gen.	<input type="checkbox"/> Large Quantity Generator	
Storm Water	<input type="checkbox"/> NPDES General permit <input type="checkbox"/> Exempt		
Air	<input type="checkbox"/> Air Level 1	<input type="checkbox"/> Air Level 2 <input type="checkbox"/> Air Level 3	<input type="checkbox"/> Air Level 4 <input type="checkbox"/> Air Level 5

To determine your public participation requirements:

- In each row, check off the status at your facility for the waste stream listed.
- If all your check marks are in the “No Public Participation” column, you have no public participation requirements.
- If you have **any** check marks in the “Limited” column, but none in the “Full” column, you have Limited Public Participation requirements.
- If **any** of your check marks are in the “Full” column, you have Full Public Participation requirements.

An Example: ABC Printing Company

	NO Public Participation	LIMITED Public Participation	FULL Public Participation
Waste Water	<input checked="" type="checkbox"/> public sewer and not an SIU <input type="checkbox"/> no discharge	<input type="checkbox"/> Significant Industrial User	<input type="checkbox"/> NPDES Individual permit
Hazardous Waste	<input type="checkbox"/> Small Quantity Generator <input type="checkbox"/> Conditionally Exempt Small Quantity Generator <input type="checkbox"/> no hazardous waste generation	<input checked="" type="checkbox"/> Large Quantity Generator	
Storm Water	<input type="checkbox"/> NPDES General permit <input checked="" type="checkbox"/> Exempt		
Air	<input checked="" type="checkbox"/> Air Level 1	<input type="checkbox"/> Air Level 2 <input type="checkbox"/> Air Level 3	<input type="checkbox"/> Air Level 4 <input type="checkbox"/> Air Level 5

- ✓ Continuing with the previous example from the ABC Printing Company, they would use the worksheet to determine their requirements for Public Participation.
- ✓ They are a Large Quantity Generator of hazardous waste, therefore they will have requirements for Limited Public Participation.
- ✓ ABC Printing's Application will be available for public review through the **Public Information Repository**.
- ✓ Note that **all** PrintSTEP Applications, regardless of whether or not the printer has public participation requirements, will be available to the public through the Public Information Repository.

How the public will be involved

The public is notified of the Application and asked to comment on it, and possibly to attend a public meeting. *How* the public will be notified depends on whether the printer has Limited or Full Public Participation requirements.

☛ General Public Notice

General Notice is notification that is available and accessible to the public in general, so that anyone interested can find out about the PrintSTEP Application.

General Notice is required for both Limited and Full Public Participation.

☛ Actual Public Notice

Actual Notice is only required for Full Public Participation. Actual Notice is used to notify individuals and registered parties in the local community specifically.

Actual Public Notice requirements were established by the St. Louis PrintSTEP Stakeholders Advisor Group.

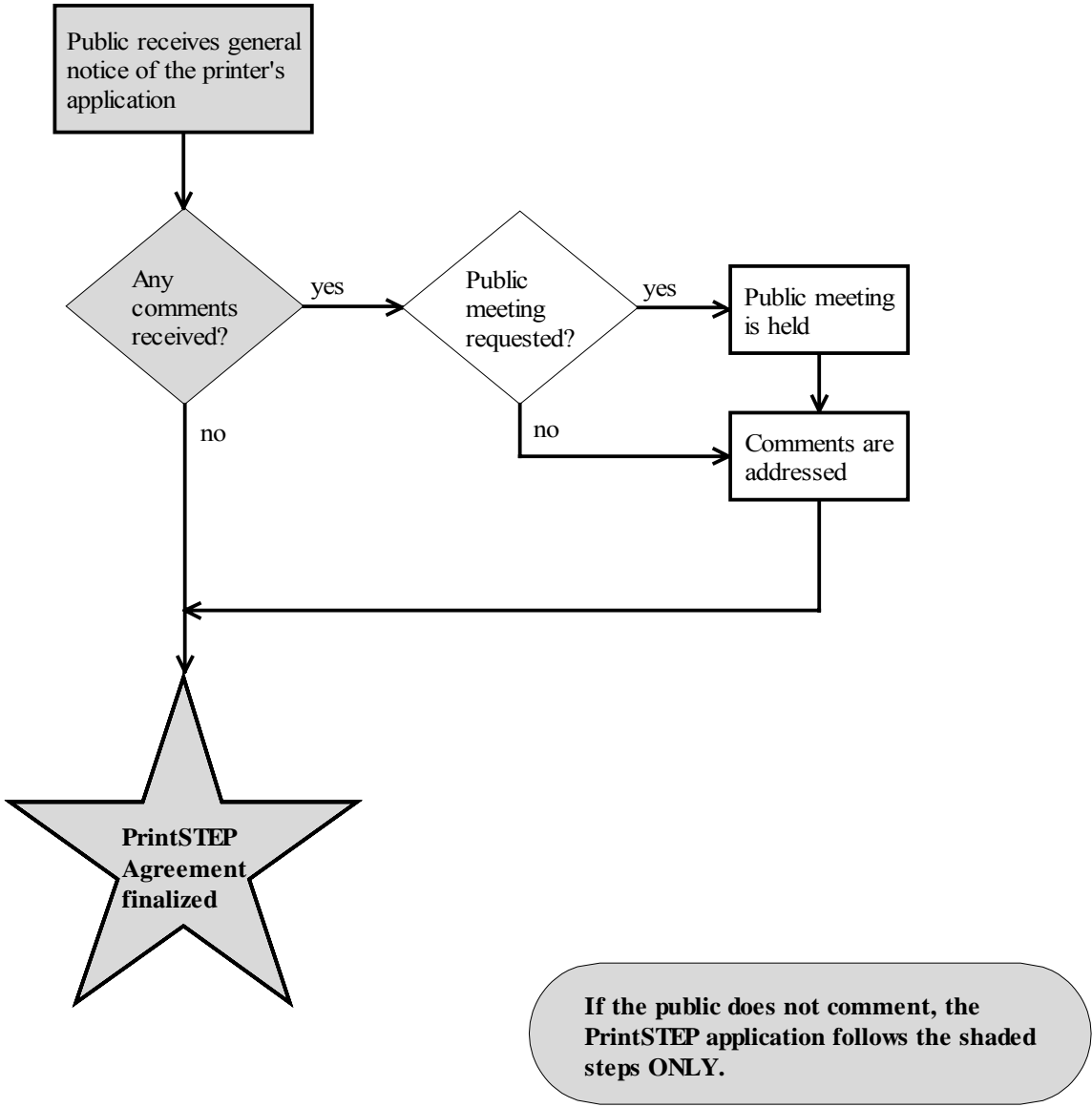
PrintSTEP Registry

Anyone interested in the PrintSTEP process can register their name with the Missouri Department of Natural Resources (MODNR). Whenever a PrintSTEP Application is submitted that has public participation requirements, appropriate registered parties will be notified about the Application. Notification of registered people is *in addition to* the notification of community members. When registering, interested parties can specify if they want notification for all facilities, or only for those in a certain geographic area. Contact your PrintSTEP Coordinator, Bill Hernlund, at (314)-301-7600 to register in the St. Louis Region.

Printers with Limited Public Participation Requirements

(See Figure 2 for an overview of the Limited Public Participation process.)

Figure 2
LIMITED Public Participation Requirements



► **The public receives Limited Notice of the Application**

The Limited Public Participation process begins when Missouri Department of Natural Resources (MODNR) approves the printer's Application. The MODNR will notify the city and county environmental agencies, local sewer district and PrintSTEP Registry participants about the PrintSTEP Application, then make the application available for review through the **Public Information Repository**. The printer will notify the local elected official(s) (City of St. Louis Aldermen, Mayors of municipalities, County Council Members or Commissioners) and implement their choice of two of the following General Notice requirements:

- place posters, signs or sandwich boards outside the facility;
- place posters or signs on the company vehicles;
- place posters or flyers on community bulletin boards in libraries, government offices and grocery stores within 1/2 mile of the facility;
- attend a neighborhood association meeting;
- sponsor a neighborhood information meeting, which is sufficiently advertised in advance, at the facility;
- sponsor an open house or block party, which is sufficiently advertised in advance, at the facility.

★**TIP**

Use your company's internet website or the local newspaper to keep your community informed.

Each publication will inform the public of:

- the nature of the PrintSTEP program and the facility's Application to participate as a PrintSTEP partner;
- how, when and to whom the public can send comments;
- how the printer is an environmentally responsible neighbor;
- any person wanting information, making comments or requesting a public meeting should notify the PrintSTEP Coordinator, Bill Hernlund, at (314)-301-7600 or email him at: nrhernb@mail.dnr.state.mo.us;
- the deadline for the PrintSTEP Coordinator to receive questions or comments.

► **The public comments on the Application**

"What will the public comment on?" The notices will ask the parties to comment on the PrintSTEP Application. The public will have thirty (30) days to submit comments to the PrintSTEP Coordinator, Bill Hernlund. These comments will address whether the Application accurately describes the facility's environmental impact. The public can comment on any part of the Application, not just the waste streams that triggered the public participation requirements. Comments may also address issues such as environmental conditions or specific populations in the area. The community may also

request that the MODNR hold a public meeting to discuss the printer's Application. Community members are encouraged to review copies of the Application and standard regulatory requirements, which are available in the **Public Information Repository** when deciding if they will comment. These requirements will be the basis for the Agreement.

"How can comments be made and who do they send them to?" The public should send their comments to the attention of the PrintSTEP Coordinator, Bill Hernlund, by mail, phone, FAX or email:

Missouri Department of Natural Resources
9200 Watson Road, Suite 201
St. Louis, MO 63126-1528
Phone: 314-301-7600
FAX: 314-301-7607
Email: nrhernb@mail.dnr.state.mo.us

"What if the community needs more information or time?" During the comment period, community members may want to call the printer or the Missouri Department of Natural Resources (MODNR) to get more information. This informal communication is a great opportunity for the printer to discuss and understand the community's questions or concerns. Also, the community can request an extension of the comment period from the MODNR.

★*TIP*

See Chapter 3 for information on how to build a partnership with your community.

"What happens after the comment period ends?" The Missouri Department of Natural Resources (MODNR) reviews the comments. If no comments are received, the MODNR will go ahead to Step 5 and finalize the PrintSTEP Agreement. If comments are received, they will be reviewed by the MODNR with the printer and the community to resolve any issues or conflicts. To do this, the MODNR may hold a public meeting. Changes may be made to the PrintSTEP Application as a result of the comments.

► **A public meeting may be held**

“Why would there be a meeting?” A meeting provides an opportunity for the printer to discuss and resolve any public comments in an open forum with members of the community and the Missouri Department of Natural Resources (MODNR). If, based on the public comments, the MODNR determines a public meeting is needed, the MODNR will arrange the meeting. The public will be notified about this meeting thirty (30) days in advance by the PrintSTEP Coordinator, Bill Hernlund.

“What will be discussed at the meeting?” The goal of the meeting is to work together with the Missouri Department of Natural Resources (MODNR) and community members to address everyone’s concerns as thoroughly as possible. This meeting focuses only on the PrintSTEP Application, and not on overall environmental issues in the community such as traffic congestion, noise, odors, or cumulative impacts. While these issues can be very important to a community, a single printer and the MODNR may not be able to address them all. However, the MODNR may assist the community to find out where to get help.

Keep in mind that PrintSTEP encourages a dialogue among all parties so that issues can be raised and addressed in a way that meets everyone’s needs. The PrintSTEP Agreement will be agreeable everyone. If any issues remain unresolved, the MODNR will make the final decision on the printer’s PrintSTEP Agreement, using the guidelines established by the PrintSTEP Stakeholders Advisory Group.

Printers with Full Public Participation Requirements

See Figure 3 for an overview of the Full Public Participation requirements. Full Public Participation requirements are similar to those for Limited Public Participation, but require both General and Actual Public Notice and an extra round of review.

► The public receives Full Public Notice

Full Public Involvement includes, and goes beyond, the General Public Notice requirements. Under General Public Notice, the city and county environmental agencies, local sewer district, PrintSTEP Registry participants, local elected official(s) and the general public will receive initial notice of the Application and can submit comments.

In addition to General Notice, Actual Notice will be provided to the community and registered parties. Actual Notice will include information about the PrintSTEP Application as well as information on how the local public can participate in this special notification process:

- the nature of the PrintSTEP program and the facility's Application to participate as a PrintSTEP partner;
- how the printer is an environmentally responsible neighbor;
- any person wanting information, making comments or requesting a public meeting should notify the PrintSTEP Coordinator, Bill Hernlund, at (314)-301-7600 or email him at: nrhernb@mail.dnr.state.mo.us;
- note the deadline for the PrintSTEP Coordinator to receive questions or comments.

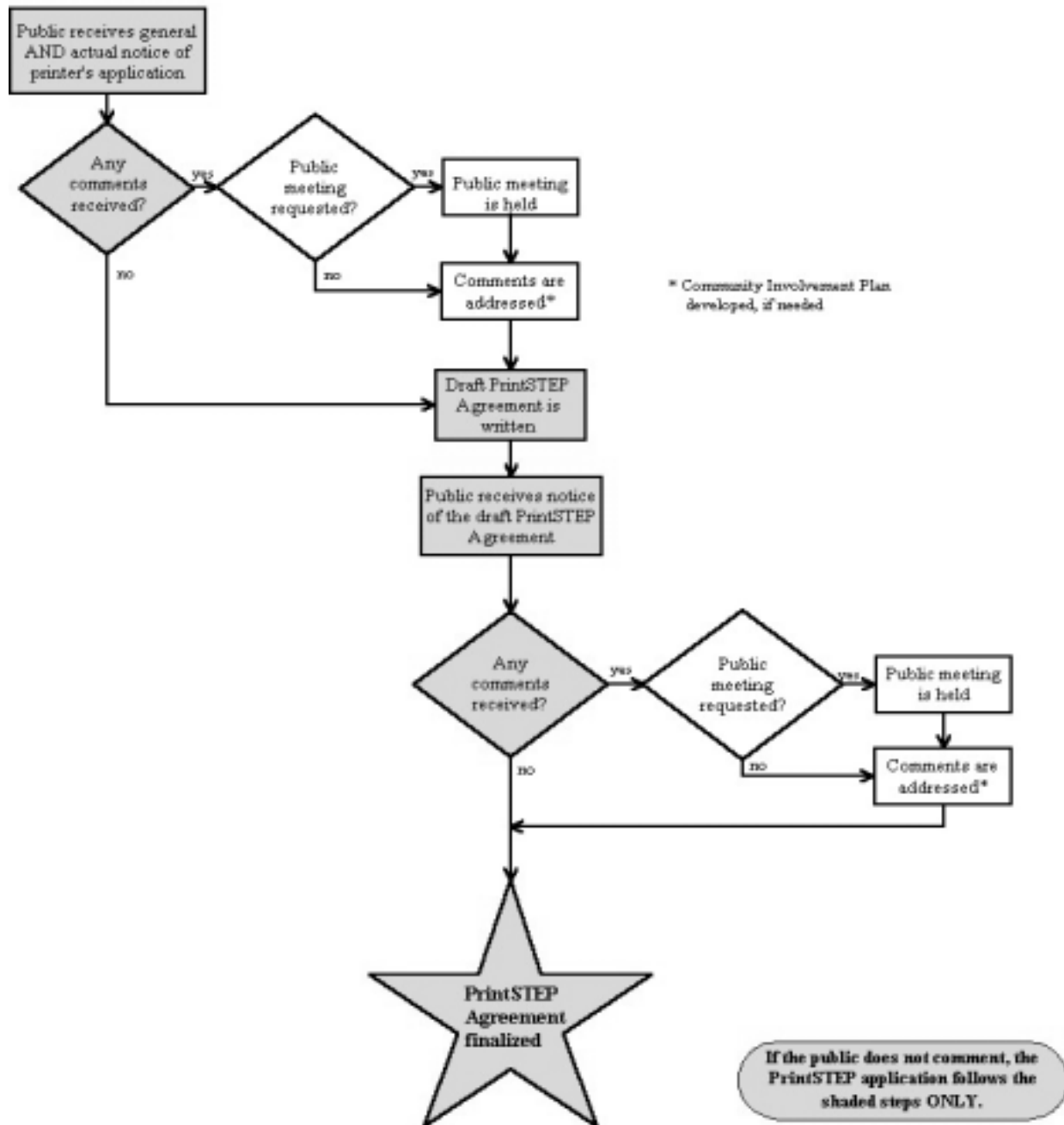
Actual Notice will also include notification to "Specific Populations" within ½ mile of the facility, including schools, day care centers, senior activity centers, hospitals, clinics and nursing homes. A letter to the Administrator, signed by the printer, will notify the Specific Population about the PrintSTEP Program.

Actual Notice will further include individual notification made to each residential and industrial location within 1/3 mile of the facility. The printer will notify the community by means of their choice of two of the following Actual Notice requirements:

- invite these parties to an introductory meeting at the facility;
- invite these parties to an open house, tours or block party at the facility;
- direct mail to each address within 1/3 mile;
- hand-deliver pamphlets to each address.

The Missouri Department of Natural Resources (MODNR) will assist the printer in locating Special Populations, local elected officials and direct mail recipients in their area. MODNR will also supply information brochures to be distributed with the letters and reimburse the printer up to \$100 in matching funds paid for fulfilling the above Actual Notice requirements.

Figure 3
FULL Public Participation Requirements



► **The public comments**

The public will be asked to comment on the draft Agreement as well as the Application. The draft Agreement and Application will be both be available in the **Public Information Repository**. There will be thirty (30) days to comment on the draft Agreement and Application.

► **Comments are addressed**

The Missouri Department of Natural Resources (MODNR), community and printer will work together to address any issues or concerns brought up at the meeting and in the public comments. Responses to all formal comments will be documented by the MODNR and will be publicly available through the **Public Information Repository**.

► **A public meeting may be held**

As in Limited Public Participation, the Missouri Department of Natural Resources (MODNR) determines if a public meeting is needed to discuss the Application based on the comments received. The public will be notified about this meeting thirty (30) days in advance by the PrintSTEP Coordinator, Bill Hernlund.

► **Comments are addressed**

The Missouri Department of Natural Resources (MODNR), community and printer will work together to address any issues or concerns brought up at the meeting. The MODNR may make changes to the draft PrintSTEP Agreement. Responses to all formal comments will be documented by the MODNR and will be publicly available through the **Public Information Repository**. A Community Involvement Plan may also be developed.

Keep in mind that PrintSTEP encourages a dialogue among all parties so that issues can be raised and addressed in a way that meets everyone's needs. Hopefully, the PrintSTEP Agreement will be agreeable everyone. If not, anyone who submitted comments may appeal the Agreement to John Young, Director of the Division of Environmental Quality. If any issues remain unresolved, the Director will make the final decision on the printer's PrintSTEP Agreement, given the procedures outlined in state regulation 10 CSR 10-6.100(9).

PrintSTEP Public Notice Summary

Members of the Public to be Informed	Location, or Distance from the Operating Facility	Limited Public Participation	Full Public Participation
Local Elected Official(s) ⁽¹⁾	Representing the Address of the Operating Facility	by a letter with brochure from the Printer and MODNR	← (in conjunction with Limited Public Participation)
Registrants of the PrintSTEP Registry	All Registered Parties	by email or a letter with brochure from MODNR	← (in conjunction with Limited Public Participation)
Specific Populations ⁽²⁾	within ½ mile of the Operating Facility	Not Applicable	by a letter with brochure to the Administrator from the Printer
General Notice	within ½ mile of the Operating Facility	by two General Notice means of contact ⁽³⁾	← (in conjunction with Limited Public Participation)
Actual Notice	within 1/3 mile of the Operating Facility	Not Applicable	by two Actual Notice means of contact ⁽⁴⁾

Definitions and Key:

- (1) “Local Elected Official(s)” are the City of St. Louis Aldermen/women, Mayors of incorporated municipalities, County Council Members or Commissioners.
- (2) “Specific Populations” are defined as the residents, visitors, patients or students at any school, day care facility, nursing home, hospital, clinic, or senior activity center. Actual Notice shall be by a letter and a brochure to the school Principal, Administrator or Director of the organization.
- (3) General Notice means of contact shall be a choice of two of the following items:
 - a sign, “sandwich board” or poster outside the operating facility;
 - a poster on a company car, delivery truck or van;
 - attend a neighborhood association meeting;
 - sponsor a neighborhood information meeting at the operating facility;
 - posters or flyers displayed on community bulletin boards.
- (4) Actual Notice means of contact shall include a choice of two of the following items (in addition to the two general means of contact chosen above):
 - sponsor an introductory meeting at the operating facility;
 - sponsor an open house or block party at the operating facility;
 - direct mail to neighbors within 1/3 mile;
 - literature drops to each home and business within 1/3 mile.

STEP 5: YOUR PRINTSTEP AGREEMENT IS FINALIZED

- ☛ The Missouri Department of Natural Resources (MODNR) will finalize your PrintSTEP Agreement.
- ☛ The PrintSTEP Agreement will contain all your requirements for process wastewater, hazardous waste, storm water, and air emissions. The Agreement replaces your current permits and approvals for these media.
- ☛ When final, the MODNR will send you your PrintSTEP Agreement. When you sign it, you're a PrintSTEP participant!
- ☛ As a PrintSTEP printer, you must operate your facility following the requirements in your PrintSTEP Agreement. These are enforceable limits on your emissions and wastes.

The MODNR will file the PrintSTEP Agreement (except for Confidential Business Information) in the **Public Information Repository**.

Chapter 2

What You Do When You Are a PrintSTEP Participant

If you have a PrintSTEP Notification Status

- ☛ Every year you must re-evaluate your facility's releases and wastes using this workbook. You must keep the annual update for your internal records, but you don't need to send it into the Missouri Department of Natural Resources (MODNR) if you still qualify for PrintSTEP Notification status (i.e., your emissions have not increased enough to where you would need a PrintSTEP Agreement). Over the next year, you must operate your facility within the limits for each of the media categories you listed on your PrintSTEP Application and follow all regulatory requirements.
- ☛ If you anticipate your emissions, releases and wastes to increase, so you no longer qualify for a PrintSTEP Notification status, you must submit a new PrintSTEP Application to the MODNR, local regulatory agencies, and the PrintSTEP Coordinator before exceeding any limits. You must follow all public participation, regulatory, and PrintSTEP requirements associated with the increased environmental emissions or wastes.

If you have a PrintSTEP Agreement

- ☛ Your PrintSTEP Agreement will describe your regulatory requirements for process wastewater, hazardous waste, storm water, and air emissions.
- ☛ Your PrintSTEP Agreement is enforceable and you are required to run your business in a way that is consistent with the requirements in the Agreement.
- ☛ Once a year, you will submit a PrintSTEP Annual report describing your facility's emissions and wastes to the MODNR. This report must also detail all of the modifications made at the facility over the previous year.

When Facilities Make Modifications

One of the features of PrintSTEP is that it enables you to make modifications that could lead to an increase in emissions or wastes without necessarily requiring approval from the Missouri Department of Natural Resources (MODNR). For example, modifications could

include process changes, equipment changes, material additions or substitutions, or production increases or decreases. The following section applies to all PrintSTEP printers and describes what printers are required to do when making modifications.

Adding a new printing process or a new type of pollution control equipment

- ☛ If you plan to add any new type of pollution control equipment or a printing process to the facility, you must fill out a PrintSTEP Addendum Notice form prior to installing the equipment and send it to the MODNR PrintSTEP Coordinator.
- ☛ On the form, you will describe the new process or equipment. You must send this Addendum Notice form to the MODNR even if the new process or equipment does not change your PrintSTEP regulatory categories.
- ☛ The MODNR will review the form and send you an Addendum. This Addendum will contain “boilerplate” language to cover all technical requirements (agreed upon set of conditions) for operating the new process or equipment.
- ☛ After you submit the Addendum Notice to the MODNR, if you do not receive a response after fifteen (15) business days, you can assume that it is approved and proceed with your process modifications.
- ☛ The MODNR will add all Addendum Notice forms and any resulting Addendums to the **Public Information Repository**.

Modifications that affect wastewater, hazardous waste, or storm water, but do not change your regulatory category for these media

- ☛ If you make modifications in your operations (other than adding a new printing process or new pollution control equipment) that do not result in any change in your regulatory categories for wastewater, hazardous waste, or storm water, there is no need to notify the PrintSTEP Coordinator. For example, if production increases result in an increase in hazardous waste generation, but you are still a “small quantity generator”, you do not need to notify the MODNR. However, if the modification involves adding a new printing process or new pollution control equipment, an Addendum Notice must be sent to the MODNR, as described above.
- ☛ For modifications within regulatory categories for these waste streams, you must follow the current regulatory procedures. Thus, PrintSTEP simply incorporates the existing modification requirements for these media.
- ☛ A description of the modification must be included in your annual report.

Modifications that affect air emissions, but do not change the facility's Air Level

- ☛ Current modification procedures under the air program are more complex. Under the PrintSTEP pilot, if you make modifications that do not increase your emissions, in most cases you do not need to notify the Missouri Department of Natural Resources (MODNR) to proceed. If you are at Air Level 1, 2, 3, or 4, you can make modifications that change your air emissions, provided that the modifications **do not increase** your PrintSTEP Air Level to the next highest Level. However, if the modification involves adding a new printing process or new pollution control equipment, an Addendum Notice must be sent to the MODNR, as described above.
- ☛ When state notification or approval is not required at the time of the modification, if you are at Air Levels 2, 3, or 4, you must describe the change in the your annual report.
- ☛ If you are at Air Level 5, the MODNR will include the process for making modifications in the printer's PrintSTEP Agreement. It is anticipated that these Agreements will include some flexibility for the facility to make pre-approved changes. Additionally, your annual report must describe any modifications that resulted in an emission increase at the facility during the year.

Modifications that result in a higher regulatory category

- ☛ For any waste stream, if you intend to make modifications (including production increases) that could increase wastes or emissions, thereby putting the facility in a higher regulatory category, **you must notify the MODNR PrintSTEP Coordinator fifteen (15) business days prior to the modification.**
- ☛ The printer must submit a new PrintSTEP Application at the higher Air Level as soon as they anticipate the increase, *before* the increase occurs.
- ☛ Printers in Air Levels 1 and 2 are not required to track emissions data monthly; however, PrintSTEP air emission limits for *all* Air Levels are enforceable. Printers must look ahead to make sure they're not exceeding their Air Level threshold. If the threshold for their Air Level is exceeded prior to approval of a new Application, the MODNR will decide on an enforcement action.
- ☛ If the modifications move the facility to a higher PrintSTEP classification category, which requires public participation, then the public will be involved in the modification process. While the public will have access to

the complete PrintSTEP Agreement, they can only comment on the part of the Agreement that is being changed.

Modifications that result in a lower regulatory category

- ☛ For any waste stream, if you make modifications (including production decreases) that decrease wastes or emissions, thereby putting the facility in a lower regulatory category, you may resubmit a PrintSTEP Application and get your regulatory requirements reduced.
- ☛ Applications for a lower regulatory category must be based on a full year of data. After one year of data, you can submit a new Application.

Technical Assistance

Technical assistance is available, free of charge, for all PrintSTEP Pilot participants. Technical assistance specialists can help you, one-on-one, over the phone or in your facility. Take advantage of this valuable resource!

- ☛ They can work with you to identify opportunities for pollution prevention.
- ☛ They can help you with your PrintSTEP Application.
- ☛ They offer compliance assistance.
- ☛ They can also guide you in the right direction to make these recommendations happen.

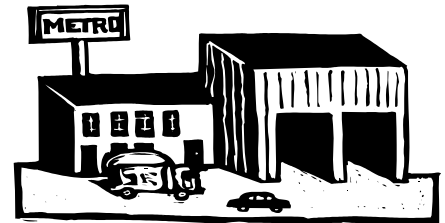
The Missouri Department of Natural Resources, Outreach and Assistance Center, Technical Assistance may be contacted locally at (314)-340-5904 or in Jefferson City at (800)-361-4827 or (573)-526-6627, or write:

**Missouri Department of Natural Resources
Outreach and Assistance Center
Technical Assistance
4030 Chouteau, 6th Floor
St. Louis, MO 63110**

OR- call your **PrintSTEP Coordinator, Bill Hernlund, at 314-301-7682.**

CHAPTER 3

How to Build a Partnership with Your Community



Why Should You Get Involved with Your Community?

Good Business-Community relations make good business sense!

We all care about the environment in which we live, work, and play. We want to feel safe from things like fire, crime, and pollution hazards that may affect whole communities. As a printer, you are, of course, an important part of the community in which you operate. As a community member, you must do your part to keep the environment clean and healthy. And some community members want to know what the businesses nearby are doing to protect their environment. Therefore, your role may include minimizing your facility's impact on the environment, as well as keeping interested community members informed of your efforts. By informing people and letting them know what you do, you can build trust and credibility with your community.

How Can You Get to Know Your Community?

Whether or not the public participation requirements under PrintSTEP apply to you, it's worth the time to talk with groups and neighbors whom you haven't communicated with before, to learn who might be interested in your facility's activities.



Keep in mind that good communications help to build a partnership with your community. When community members aren't informed of new developments, they may assume that the situation is worse than it is. The best way for you to avoid this is to demonstrate your environmental responsibility by communicating openly with them about your facility. Some ways to do this beyond formal public participation requirements are:

- ☛ Invite community members in for a facility tour. By explaining your processes and showing them how you handle your wastes, you are building trust.
- ☛ Publicize any emissions reduction goals you may have, and report your progress. This informs people of your concern about the environment and that you are actively reducing your environmental impact.
- ☛ Communicate early and often with the public about your operations, particularly if you are planning new projects.

Keep the Conversation Going

Once you get acquainted with the different members of your community, it is important to engage in a continuing dialogue to foster your relationship. Besides the PrintSTEP requirements for public participation, here are some suggestions to keep the community informed.

- ☛ Hold meetings to gather public comments on your company's operations. These are not meant to tell you how to run your shop. Rather, they provide a forum for both you and community members to air concerns about the environment, clarify misunderstandings, and find workable solutions.
- ☛ Offer your employees opportunities to participate in the community as "ambassadors" of your printing business through company-sponsored service projects or other arrangements. By encouraging your workers to talk with others about your shop and to bring back peoples' concerns, you will set an example of trust and openness with your staff that will build credibility with your community.

Involving the Public Early: Everyone Benefits

Let's say that you work through Step 4 of PrintSTEP and find you have requirements for Full Public Participation based on your releases. However, instead of waiting until the Missouri Department of Natural Resources (MODNR) sends out notice, you decide that you would like to hear about the community's concerns early in the process. So, you post a sign outside your facility announcing a facility Open House.



During the Open House, you meet some of your neighbors and other community members. You give them a tour and they ask a lot of questions about your processes. Some people ask questions about your use of solvents. They are concerned about the health risk from inhalation of vapors, both inside and outside the facility. You explain the things you've done to reduce emissions, as well as why you are using certain technologies. They are curious about how much a new press (that you plan to install later in the year) will increase emissions. At the end of the tour, the participants are enthusiastic about the steps you've taken so far to reduce emissions, but they ask to have another tour after your new press is installed.

The tour has helped the community understand your process. When it's time for public comment and participation as part of PrintSTEP, your community will be more informed. You may have even answered all of their concerns, in which case a formal public meeting may not be needed, expediting the PrintSTEP process.

Who Gets Actual Notice

In PrintSTEP, the community will receive notice of each application for a PrintSTEP Agreement. General Notice and Actual Notice to the communities are described in Step 4 of Chapter 1. But who is included in "the community"? Every community is different, as is every printer. No hard-and-fast definition can describe all of the diverse communities in St. Louis. To figure out who gets General Notice or Actual Notice of the PrintSTEP Agreement and Application, the Stakeholders Advisory Group defined the relevant communities at the start of the PrintSTEP pilot project. The Stakeholders Advisory Group considered the following aspects in defining the community:

- ☛ Each public notification includes the local elected officials, participants in the PrintSTEP Registry (see page 1-68) and the local environmental authorities.

- ☛ Actual Notice includes the residents and industrial neighbors within a 1/3-mile radius of the facility.
- ☛ “Specific Populations”, such as hospitals, nursing homes, schools, or day care centers, within a 1/2 -mile radius of the facility are individually informed.
- ☛ Disproportionately affected populations might be especially concerned about facilities in the area. In the past, poor and disadvantaged communities have often suffered more than other communities from exposure to environmental pollution.
- ☛ Natural boundaries will be taken into consideration, such as watershed areas that extend beyond man-made borders.
- ☛ The Stakeholder Advisory Group also wants to involve existing local groups. The neighborhood associations, local businesses and their employees, groups concerned with the environment, environmental justice advocates, health advocacy groups and religious institutions will serve as forums for interested community members to voice their concerns.

Environmental risk and risk management

Environmental and health risk factors determine who gets Actual Notice. Simply put, these risk factors consider the potential that some hazard to public health or the environment may occur. One approach to evaluating risk is called risk assessment. While risk assessment is not a part of PrintSTEP, it is described here to give you a fuller understanding of how some environmental decisions are made.

Risk assessment is an evaluation of the potential for a problem to occur and the scientific analysis of its threat to human health and the environment. The evaluation may include information on how harmful the chemical is and whether it is more dangerous if a person drinks it, breaths it, or gets it on their skin (hazard); information on the likelihood of people or the environment coming into contact with the chemical (exposure); and the length and frequency of contact.

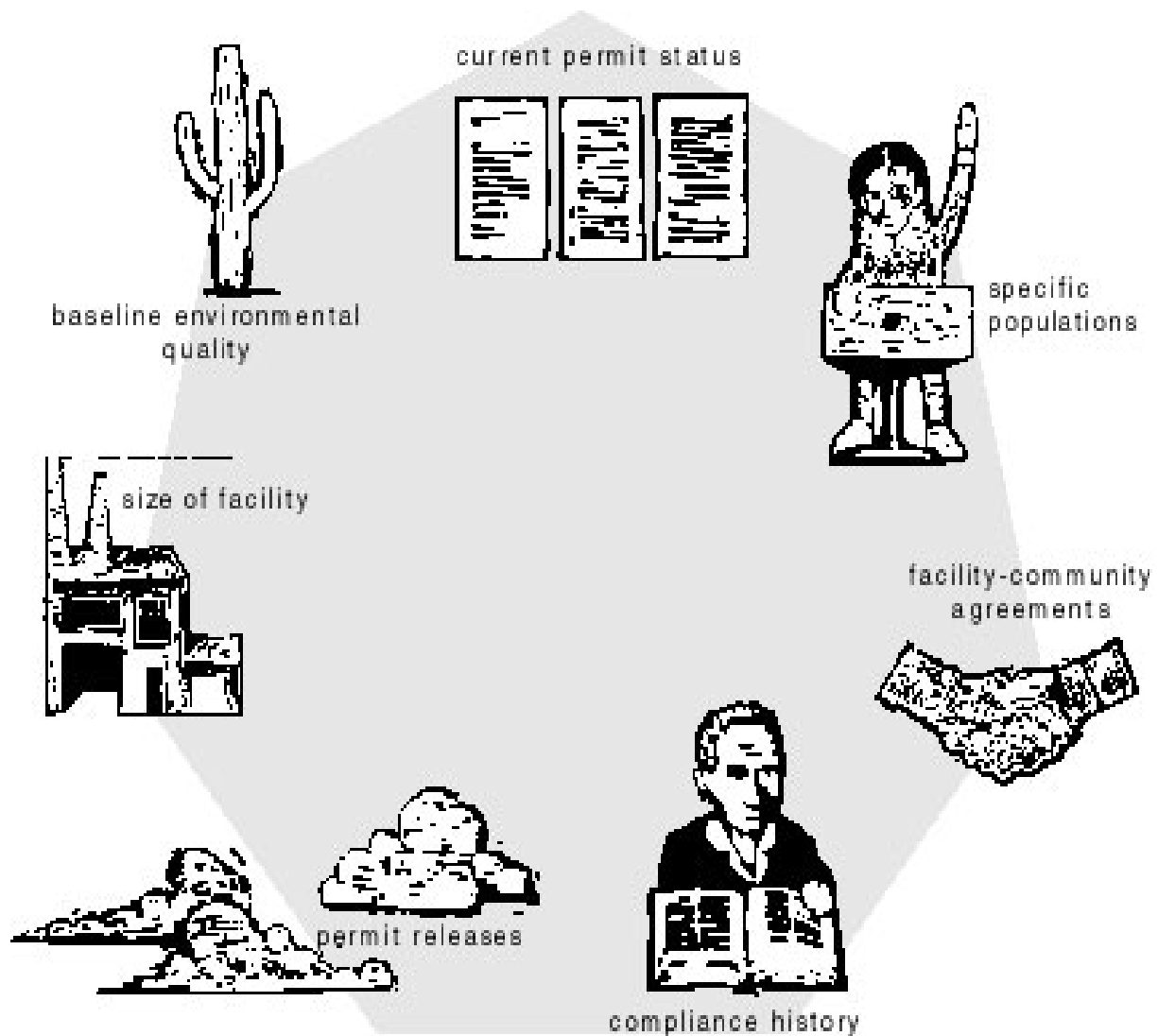
Risk assessments are the best available technology for us to use today. Although risk assessments are based on science, they are rarely precise because absolute data almost never exists. Additionally, most assessments consider just one chemical, one environmental medium (air, water, or land), and one risk at a time, so the results are not always reflective of “real life” circumstances. It is also important to note that a formal risk assessment is a time-consuming and expensive process.

Risk management is the process of identifying, evaluating, selecting, and taking actions to reduce risks to human health and to ecosystems. This process tries to account for social, cultural, ethical, political, and legal considerations. In deciding how best to manage risks at a particular facility, a number of factors need to be considered, depending on the circumstances (See Figure 4):

- ☛ **Size of the Facility** What is the total number of employees? How many employees perform activities of specific concern?
- ☛ **Impacted Population** What is the population density? Are residents or specific populations nearby?
- ☛ **Permit Releases** Is the facility seeking a new permit or a modification of an existing permit?
- ☛ **Regulatory Thresholds** What regulatory thresholds apply to air, water, and hazardous waste?
- ☛ **Compliance History** Has the facility complied with state and local regulations, emergency planning and community right to know requirements, OSHA requirements, etc.?
- ☛ **Baseline Environmental Quality** What is the existing quality of air, water, land; proximity to sensitive eco-systems; proximity to other industries; and potential cumulative impact from all emission sources?
- ☛ **Agreements Between Facilities and Communities** Does the facility have an on-going relationship with the community?

The Missouri Department of Natural Resources (MODNR) studied a hypothetical example of an air contamination release from a large facility. This model estimated that the average health and environmental risks are normally negligible at a distance of 1/3-mile from the facility. Based on this model, the Stakeholder Advisory Group established the typical distance of notification for residents and industrial workers to be a 1/3-mile radius.

Figure 4: Factors to Consider in Evaluating Risk



CHAPTER 4

Pollution Prevention Case Studies

What is Pollution Prevention?

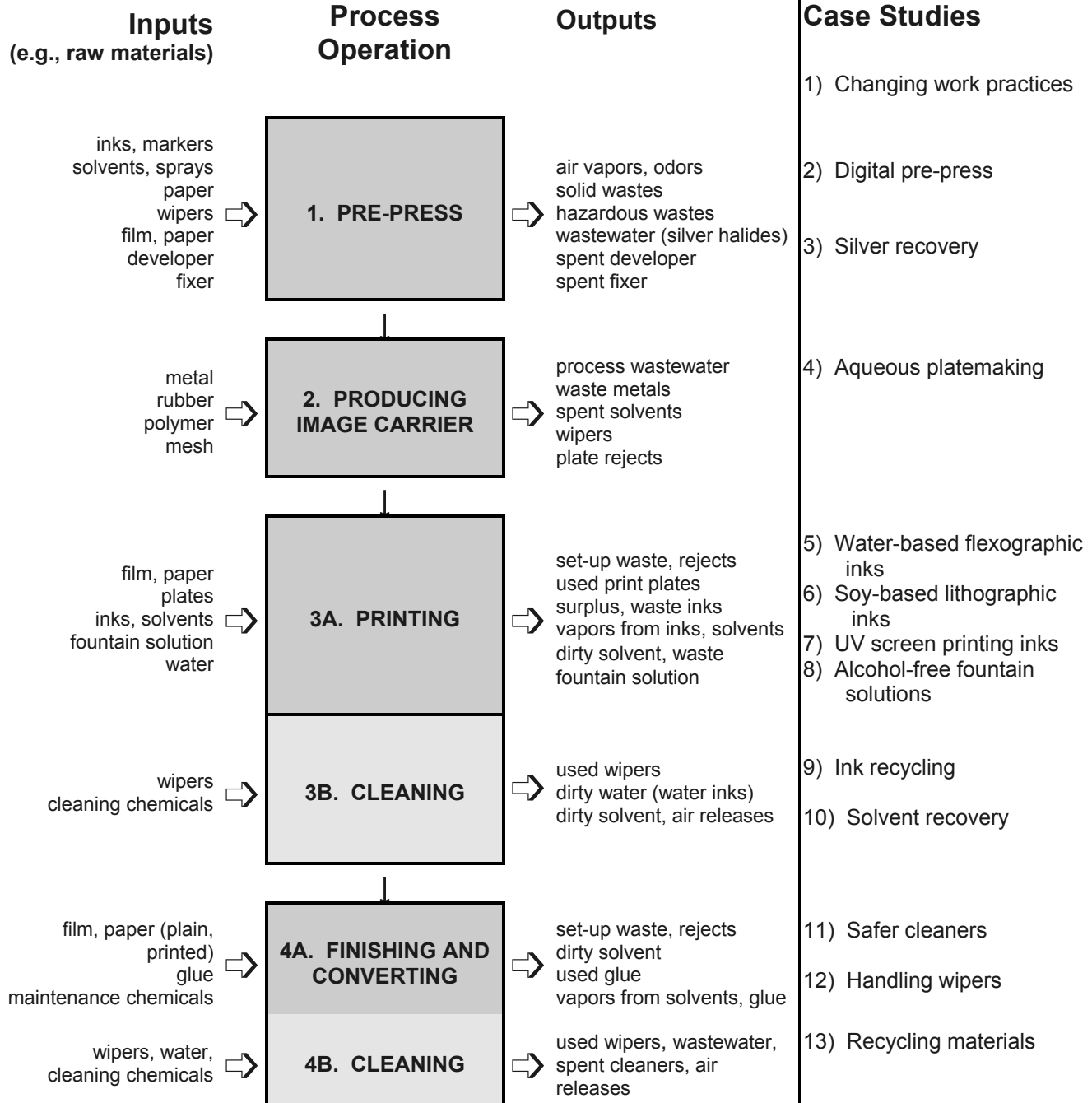
This section of the *Workbook* presents case studies from printers who have reduced their wastes or emissions and improved their efficiency at the same time. Traditional methods of handling pollution include treatment and disposal. Now more and more printers are finding that it's better to prevent pollution generation in the first place: if you don't generate waste, there is nothing to treat or dispose. Other benefits to this approach may include reduced regulatory requirements, savings on disposal costs, and savings on raw material costs. By preventing pollution, you eliminate a problem right from the start, including any future liability that comes with that problem.

It's not always easy to do this, and pollution prevention projects may in fact take a lot of time and initially cost a lot of money. Pollution prevention might mean changing processes that you've used for a long time, or changing a solvent that has worked well for you. You may find that there is no obvious way to prevent pollution for a particular waste stream, and that treatment and disposal is really the only option for you.

How Do I Get Started?

TO FIGURE OUT WHERE YOU CAN PREVENT POLLUTION IN YOUR FACILITY, START BY MAKING A "PROCESS MAP". THIS SHOWS ALL THE MATERIALS YOU USE IN YOUR PROCESS (INPUTS) AND ALL PRODUCTS, WASTES, AND EMISSIONS YOUR PROCESS CREATES (OUTPUTS), AS SHOWN IN THE EXAMPLE ON THE NEXT PAGE. BY PUTTING THIS ON PAPER, YOU WILL BE ABLE TO MORE EASILY IDENTIFY WHERE YOU MAY BE ABLE TO REDUCE WASTES OR EMISSIONS THROUGH POLLUTION PREVENTION.

Process Map



To create your process map, list each step in your process. For each step, write down what materials are going into the process step, and what's coming out. Include everything you can think of. For example, in addition to ink and paper, include other materials like shop towels, water, or electricity. The Sample Flow Chart that follows this section does not represent everything that should be on your flow chart, but you can use it as a starting point.

Once you identify opportunities to prevent pollution in your facility, develop a

Write a Pollution Prevention Plan for Your Facility

pollution prevention plan. This will help you to evaluate all the opportunities available to you, and to establish which ones you will work on first. In addition to reducing your wastes and emissions, this pollution prevention plan can be an excellent tool to help you communicate your environmental efforts and goals to interested members of your community.

Although there may not be a solution to some of your waste problems right now,

How Can Supplier and Customer Relationships Help?

the market is changing constantly and alternative products are always being introduced. Let your suppliers and distributors know that you're interested in finding out about products that can reduce your impact on worker and environmental health. Your role as a customer can be a powerful one, and your suppliers rely on you to let them know what features are important in their products. In turn, printers have customers. Your customers may tell you that they would like you to be environmentally conscious. You can also advertise your environmental accomplishments to help bring in more business.

Environmental Cost Accounting as a Tool

Efficient production is dependent on accurate and consistent measurement of inputs and outputs. As is often said, "what gets measured gets managed".

Without good cost information it's difficult to assess your profitability, and even more difficult to know what to change to make your business more profitable.

Environmental cost accounting is how environmental costs are identified and allocated to each process of a firm's operations. When you use environmental

accounting concepts, your company will be able to bring environmental goals and financial goals together. This shows how environmental improvement can lead directly to financial improvement.

When evaluating environmental investments, firms typically look at only the direct costs of equipment, raw material, labor, and waste disposal. Less obvious costs associated with waste treatment, permitting and reporting, liability, and benefits from improved public image are usually not considered. For example, some environmental compliance costs are incurred only when use of a material or generation of a waste exceeds a certain threshold; if you reduce your material use below this threshold or use a different chemical, you can save money on permitting and managing the waste. By not including these less obvious financial impacts, a company may underestimate the benefits of a pollution prevention project and may reject a good investment.

What Tools Are Available?

There are several good, free references available to help you:

- ☛ *Green and Profitable Printing* is a video accompanied by a notebook. This was produced by the University of Wisconsin Extension, Solid & Hazardous Waste Education Center, in collaboration with the Graphic Arts Technical Foundation. They can be reached at (608) 262-7376 or fax (608) 265-3459.
- ☛ *Snapshots of Environmental Cost Accounting* includes case studies of printers and others who have applied these concepts written by Tellus Institute. You can contact Tellus Institute at (617) 266-5400, fax (617) 266-8303 or www.tellus.org.
- ☛ *P2 Finance* software packages have been designed for lithography, screen printing, and flexography. The software provides worksheets and instructions to walk you through the steps of conducting an environmental cost accounting assessment at your facility. Contact Tellus Institute at the number above.
- ☛ Check out EPA's Environmental Accounting Project's website at www.epa.gov/opptintr/acctg.
- ☛ The Missouri Department of Natural Resources, Outreach and

Assistance Center, Technical Assistance may be contacted locally at (314)-301-7600 or in Jefferson City at (800)-361-4827.

A lithographer set out to determine if the capital investment in a computerized pre-press system is

Case Study: Environmental Cost Accounting

justified. This is a 15-employee firm with annual revenues of \$1 million. The firm currently sends any jobs it receives on diskette to a service bureau to produce film for platemaking. The company did a quick financial analysis which calculated the initial capital cost of installing a computer pre-press system and annual savings possible. Then they did an in-depth "total cost analysis" which revealed additional costs and savings. The differences in the results of the two types of analyses are shown in the table below.

Traditional Cost Analysis	Total Cost Analysis
Savings	
reduced use of the service bureau	All savings listed for Traditional Cost Analysis, plus:
reduced courier charges	10% increase in revenue (due to faster turnaround, and gave them better process control)
	reduced labor for pre-press darkroom
	reduced labor for stripping operations
	reduced supervision cost
	reduced use of darkroom chemicals
	reduced use of external typesetting services
Costs	
Equipment costs	All costs listed for Traditional Cost Analysis, plus:
Installation costs	labor time to solicit and consider bids
	contractor work associated with accommodating the new equipment
	initial training costs
	new computer pre-press labor
	increased film costs
Results	
5-year net present value of \$58,358	5-year net present value of \$187,700
5-year internal rate of return of 51%	5-year internal rate of return as 132%
Payback period of 2.14 years	Payback period of 0.82 years

Source: Tellus Institute, ASnapshots of Environmental Cost Accounting®

Case Study 1: Effectively Changing Work Practices

One printer in Minnesota discovered that addressing employee concerns in advance might help ensure success and a change for the better. When considering a change of cleaning solvents to more environmentally friendly products, the company was challenged to find both a technical solution that met production requirements and to devise new cleaning procedures that would work with lower vapor pressure cleaning solvents. However, each press crew had different methods to clean printing blankets on the press. The challenge would be to get the crews to buy into changing their very personal methods to the new method.

The company prepared three documents to help the transition. The first document contained background information and highlighted potential and real costs of not changing, as well as the benefits to the environment and to working conditions. The second document provided a clear, step-by-step description of the new cleaning procedure. The company described exactly what the press operator would experience in using the new procedure and product, specifically what it would look like, what it would smell like, and what it would feel like. Providing these important details gave the company tremendous credibility with all of the crews, because there were no surprises. The third document presented frequently asked questions that were raised in earlier interviews with different crews.

As a result of the thorough preparation, the change in work practices and cleaning solvent was completely successful. Today, all cleaning solvents are recovered and recycled back to the facility for reuse. The company eliminated costly hazardous waste disposal, improved indoor air quality, maintained production performance standards, and gained customer and community good will. In addition, employees recognized that they had a very big role in the success story.

Source: Jeff Adrian, The John Roberts Company

Case Study 2: Digital Pre-Press

Print Design is a screenprinting facility. Because Print Design does not have a high-resolution output device, it uses service bureaus to generate camera ready art and proofs. Currently Print Design uses gelatin silver photographic film to generate positives from camera-ready art. However, since Print Design uses an on-site septic system, it is prohibited from disposing process water from its darkroom down the drain. Silver must first be recovered from the wash water, then wash water and fixer are collected separately for off-site disposal.

Increasing waste disposal costs and costly service bureau charges prompted Print Design to examine production changes that would decrease its reliance on waste haulers and service bureaus. One option, a dry film imaging system, would allow Print Design to generate positives directly from the computer, thus bypassing the darkroom. Not only would this option reduce service bureau charges, but it would also reduce darkroom and waste disposal costs. However, this system had a limitation: the maximum width of dry film is currently 42 inches, but Print Design produces jobs up to 48 inches in width.

Print Design estimated costs to determine the feasibility of implementing a dry film imaging system. First, Print Design collected costs for its current pre-press process. Silver film and chemical costs, and service bureau costs were available from the company's general ledger. Labor costs associated with process camera operation were estimated. Investment costs for the new dry film imaging equipment were collected from the system vendor. A staff training budget was estimated. Because the dry film system could only handle jobs up to 42 inches wide, Print Design would continue to use the darkroom and service bureau for its widest jobs. However, the process camera operator would only be required half-time, and annual service bureau costs would be significantly reduced.

Print Design decided to implement the dry film system. This will allow them to get its jobs to press faster by avoiding the minimum 24-hour turnaround time required when using service bureaus. Therefore the new system is expected to net Print Design additional earnings, enabling Print Design to accept jobs it had to turn down in the past because of the turnaround time the service bureau needed would have taken too long to meet customer's deadlines.

Source: Tellus Institute, Boston, MA

Case Study 3: Silver Recovery

One Vermont printer significantly reduced the volume of wastewater generated by implementing closed-loop recycling and evaporation. Part of this reduction was due to the elimination of film processor wash water. The company installed four small ion exchange units that were hard-piped to individual film processors. The ion exchange units remove silver from the wash water. The rinse water is then filtered to remove resin particles and is reused in the film processors.

The company also uses an electrolytic silver recovery unit to remove silver from spent fixer. An electrical current is applied to two electrodes immersed in the solution; silver is collected on one of the electrodes, removed periodically, and sold. An ion exchange system is also used to remove silver after the electrolytic silver recovery step. The de-silvered fixer is stored on-site until it can be evaporated. These steps reduced the volume of hazardous wastewater streams along with the costs associated with managing and disposing of the hazardous streams.

Source: Vermont Agency of Natural Resources, Pollution Prevention Division, Pollution Prevention Successes: A Compendium of Case Studies from the Northeast States, NEWMOA, December 1993

Case Study 4: Aqueous Platemaking

A lithographic printing facility in Virginia discovered that using conventional plate developers generated polymer waste that may be considered and treated as hazardous waste. The company decided to switch to aqueous plate processing. This process uses water and requires a different type of plate. By switching to aqueous platemaking, the company significantly reduced its polymer waste stream.

Source: McMichael, Stu, 'Running Green', An Environmental Case Study, Business Management Advisory, Printing Industries of America, Inc., April 1992

Case Study 5: Ink Alternatives C Water-Based Flexographic Inks

A wide web flexographic printing facility in Illinois successfully reduced volatile organic compounds (VOCs) and hazardous waste by switching from solvent-based to water-based ink. The company manufactures decorative packaging products for the floral industry, producing approximately 125 to 150 million linear feet of product per year from flexographic presses.

The company found that its solvent-based inks (50 percent VOCs by weight) were the primary source of its VOC emissions. The company decided to replace its solvent-based ink system with a water-based system. There were many technical challenges with using water-based inks, including drying problems and variable print quality. However, the facility was dedicated to the new system, conducted many hours of research, and found solutions. For example, the company improved its drying systems by lowering temperatures and increasing airflow rates, and improved print quality by monitoring the pH and viscosity of the inks.

As a result of switching inks, the company reduced its VOC emissions 99 percent in seven years. The only VOC emitted was dipropylene glycol methyl ether, which is not a hazardous air pollutant (HAP). In addition, the facility completely eliminated hazardous waste from waste ink and cleaning operations. A small amount of non-hazardous solid waste is generated from disposable cleaning wipes. The reduction in VOC emissions and hazardous waste occurred even as the company's production more than doubled during the seven-year time frame.

Source: Design for the Environment Flexography Case Study 1: Reducing VOCs in Flexography, EPA 744-F-96-013

EPA's Design for the Environment Program: Through the DfE program, EPA develops and provides businesses with information to make environmentally informed choices and design for the environment. DfE forms voluntary partnerships with industry, public interest groups, universities, research institutions, and other government agencies to develop environmentally friendly alternatives to existing products and processes. Within each project, the DfE program ensures that the information reaches the people who make the choices - from managers to industrial design engineers to materials specifiers and buyers.

Case Study 6: Ink Alternatives C Soy-Based Lithographic Inks

A facility in Illinois has one of the first sheetfed offset presses in the U.S. to use soy-based inks. The main potential environmental benefit claimed for soy-based inks is that they emit fewer VOCs than traditional petroleum-based inks. Sheetfed soy-based inks are defined as those that have a minimum of 20 percent soy oil by volume.

This facility found that it uses 17 percent less soy-based ink than petroleum-based ink. This difference is offset by the slightly higher cost of soy-based inks. However, there are other less tangible benefits to using soy-based inks, including improved company image, improved employee morale, and customer preference for the product. Other factors, such as makeready time, product appearance, and cleanup effort, remained essentially the same. The facility's customers found the print quality acceptable, and many prefer to have their job printed with the soy-based inks.

Source: Simpson, Beth, et. al., Project Summary: Waste Reduction Evaluation of Soy-Based Ink at a Sheet-Fed Offset Printer, Risk Reduction Engineering Laboratory, EPA 600-SR-94-144, September 1994

Case Study 7: Ink Alternatives C Ultraviolet-Curable (UV) Screen Printing Inks

A screen printer doing about one million dollars of business installed an UV curing process, which eliminates 40 percent of their solvents and solvent-based inks. Currently, it uses the UV process for 80 percent of its work. All regulatory limits on chemicals and metals in their wastewater have been met, except for total petroleum hydrocarbons, which was at 150 to 170 ppm prior to installation and is now at 14 to 17 ppm.

In the past using solvent inks, the presses had to be cleaned every 100 sheets to 150 sheets to ensure ink would not dry on the screens. This affected the consistency of the jobs. The UV process has reduced the need to stop work to inspect and clean the press.

Although this printer is reinvesting in new materials to make the operation more amenable to this process, it is noticing an increase in profits due to new jobs with firms that like the high-gloss finish, and savings in production and labor. Since the UV unit was installed, business has increased by 20 percent and is growing.

Source: Massachusetts Office of Technical Assistance

Case Study 8: Alcohol-Free Fountain Solutions

A folding carton manufacturer and printer in Massachusetts was using large amounts of isopropyl alcohol (IPA) in the fountain solution for its offset printing presses. The company was generating up to six 55-gallon drums of waste solution per month from four sheetfed offset presses. To address the economic, health, and environmental concerns of using IPA, the company installed a new alcohol-free fountain solution delivery system. Reverse osmosis equipment was also installed to filter water and adjust pH and conductivity, because IPA substitutes are less tolerant to variations in water quality.

By switching to an alcohol-free fountain solution, the company has nearly eliminated VOC emissions and also realized cost savings. The new fountain solution delivery system cost \$108,000, but the cost savings in material costs alone provided a payback period of less than two and a half years. In addition, there are substantial cost savings from increased production efficiency, reduced disposal costs, and reduced permitting costs.

Source: Toxics Use Reduction Case Study: Alcohol-Free Fountain Solutions at Americraft Carton, Inc., Office of Technical Assistance (OTA)

Case Study 9: Ink Recycling

A newspaper company wanted to recycle its ink but couldn't afford an on-site recycling system. The company decided to use a third party, mobile ink recycling service, which doesn't require extensive capital investment. The company collects waste ink, keeping process colors and black in separate drums. The recycling service treats and recycles the waste ink, producing ink that is ready for reuse. Only paper residue from the original waste stream needs to be disposed of.

The company saves approximately \$20,000 per year in disposal costs and \$10,000 per year in labor costs by not having to manage the hazardous waste stream.

Source: Newspaper Association of America, Pollution Prevention Manual, in press

Case Study 10: Solvent Recovery

One gravure company found that the greatest savings could be obtained by using recovered solvent instead of virgin solvents for cleaning at press side. This company produces approximately 14 billion printed labels per year. About 75 percent of the printing cylinders are chemically etched; the other 25 percent are mechanically etched. The company found that most of its waste other than water and paper consisted of spent solvents.

By using recovered solvent instead of virgin solvent for cleaning press parts, the company now saves approximately \$285,000 per year.

Source: Kirsch, F. William and J. Clifford Maginn, Environmental Research Brief, Risk Reduction Engineering Laboratory, EPA 600-M-91-047

Case Study 11: Safer Cleaners

Today, more and more cleaning formulations for printing presses and plates are safer than traditional solvents, such as toluene and methyl ethyl ketone (MEK). The safer alternatives have been developed for both solvent- and water-based formulations, and can be applied both on and off the press.

Various printing facilities used these alternative formulations with satisfactory cleaning results and without generating hazardous waste. One facility found that the cleaner was effective at penetrating the relief images of plates and required less brushing than most other cleaners on the market. At another facility, the safer cleaner provided better results with fewer hassles than the previously used product.

In the new solvent-based cleaning formulation, toluene and other hazardous petroleum distillates are replaced by aliphatic hydrocarbons and proprietary components. The new water-based cleaner is a low-foaming liquid that is intended to work when the water-based inks and coatings are still wet. However, most water-based cleaners are still not effective enough to clean water-based inks that are dried (e.g., plugged anilox rollers in flexography) to satisfy printers.

Source: Shapiro, Fred, A Cleaning and Quality: Partners in Reducing Pollution, © FLEXO, August 1998, p. 18.

Case Study 12: Handling Shop Towels

A printing facility in Connecticut has significantly reduced its waste streams and implemented various techniques to prevent pollution. One area of concern was the cleanup process. Solvent-laden shop towels are considered hazardous waste. If there is too much solvent in the towels, they could be rejected by industrial laundry services. The company recycles the shop towels through an industrial laundry and reuses them. To minimize the solvent in the towel before laundering, the facility now places the towels on a strainer in a closed container. Reusing shop towels reduces the amount of hazardous waste sent off-site and also reduces the costs of hazardous waste disposal.

Source: Feldman, Michael, "Pollution Prevention: Environmental Management's Next Goal," GATFWORLD, Vol. 5, Issue 6, 1993

Case Study 13: Recycling Materials

A lithographic printing facility in Iowa recycles its materials to reduce waste. The company recycles paper and plastic waste, waste negatives, and printing plates. Employees at the company believe that there are two important aspects to implementing an effective recycling program: a company commitment to recycling, and persistence in identifying vendors to help with individual waste streams.

The company provides economic incentives based on the company's profit; employees are supportive of pollution prevention and recycling initiatives, because waste drains the bottom line. Employees are trained to segregate, rinse, and recycle materials. The company has also established a network with other businesses to help identify vendors and markets for recycled materials.

Source: Iowa Waste Reduction Center, University of Northern Iowa, Pollution Prevention Manual for Lithographic Printers, pp. 63-64

CHAPTER 5

Information and Technical Assistance

There is a tremendous amount of information available to help you implement pollution prevention ideas and to comply with environmental regulations. The following list includes some easy-to-access sources of information.

Seek assistance for cost-effective pollution prevention!

The local publicly owned treatment works (public sewer) has recently begun an effort to reduce discharges of silver and other metals into the water. John Johnson at ABC Printing was having difficulty meeting the new levels using current operations. He didn't know where to start, so he called his state technical assistance office that specializes in pollution prevention, free of charge. A specialist paid them a visit. The specialist has worked with a lot of printers to resolve this type of problem, and was able to suggest a silver recovery unit and several vendors who sell them. Mr. Johnson took their advice, and installed silver recovery equipment. ABC Printing is now able to meet their discharge limits, and after selling the recovered silver, they found that the device paid for itself within a year!

Contacts:

Missouri Department of Natural Resources

Outreach and Assistance Center
Jefferson City: (800)-361-4827

Technical Assistance
St. Louis: 314-340-5900

or

(800)-361-4827

Missouri Small Business Compliance Advisory Committee

or

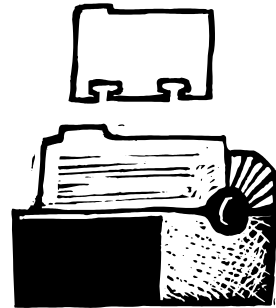
PrintSTEP Coordinator
Bill Hernlund
Missouri Department of Natural Resources
9200 Watson Road, Suite 201

St. Louis, MO 63126-1528

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Flexible Packaging Association

a trade association
1090 Vermont Ave., NW
Washington, DC 20015
Mark Wygonik
phone: (202) 842-3880
fax: (202) 842-3841



Flexographic Technical Association

a trade association
900 Marconi Avenue
Ronkonkoma, NY 11779
Doreen Monteleone
phone: (516) 737-6020 x. 18
fax: (516) 737-6813
e-mail: dmonteleone@vax.fta_ffta.org

Graphic Arts Technical Foundation (PIA/GATF)

a non-profit education and research foundation
200 Deer Run Road
Sewickly, PA 15143
Gary Jones
phone: (412) 741-6860
fax: (412) 741-2311
e-mail: GaryJGATF@aol.com

Gravure Association of America

1200A Scottsville Rd.
Rochester, NY 14624
Greg Tyszka
phone: (716) 436-2150
fax: (716) 436-7689

National Association of Printing and Ink Manufacturers (NAPIM)

a trade association
777 Terrace Ave.
Hasbrouck Heights, NJ 07604
George Fuchs
phone: (201) 288-9454
fax: (201) 288-9453

National Pollution Prevention Roundtable

organization of state and local pollution prevention programs

2000 P Street N.W.

Washington, DC 20036

phone: (202) 466-P2P2

fax: (202) 466-7964

website: www.p2.org

Newspaper Association of America

a trade association

1921 Gallows Road, Suite 600

Vienna, VA 22182

Kelley Clark

phone: (703) 902-1833

fax: (703) 902-1857

e-mail: clark@naa.org

Packaging and Label Gravure Association (PLGA)

P.O. Box 6185

Venice, FL 34292

Reg Farrant

phone: (941) 473 0807

fax: (941) 473 0834

website: www.plga.com

Pollution Prevention Information Clearinghouse

an EPA-operated library and hotline

U.S. Environmental Protection Agency

401 M Street SW

Washington, DC 20460

phone: (202) 260-1023

fax: (202) 260-0178

e-mail: ppic@epamail.epa.gov

Printers National Environmental Assistance Center (PNEAC)

a computer-based assistance center

www.pneac.org or contact:

Gary Miller

Illinois Waste Management and Research Center

phone: (217) 333-8940

Wayne Pferdehirt

University of Wisconsin Solid & Hazardous Waste Education Center

phone: (608) 265-2361

Printing Industries of America (PIA/GATF)

a trade association

National: Ben Cooper

100 Daingerfield Road

Alexandria, VA 22314

phone: (703) 519-8100

Printing Industries of St. Louis (PISTL)

a trade association and local affiliate of (PIA/GATF)

Bob Tyler

President

1790 South Brentwood Blvd.

St. Louis, MO 63144

(314)-962-6780

e-mail: bobtyler@pistl.org

website: <http://www.pistl.com>

Screenprinting & Graphic Imaging Association International

a trade association

10015 Main Street

Fairfax, VA 22031

Marcia Y. Kinter, Vice President-Government Affairs

phone: (703) 385-1335

fax: (703) 273-2870

e-mail: govt@sgia.org

website: www.sgia.org

Tag and Label Manufacturers Institute

1700 1st Ave S.

Iowa City, IA 52240-6041

phone: (319) 337-8247

CHAPTER 6

Occupational Safety & Health and Environmental Protection Programs

Introduction

Although this Workbook is primarily an environmental document, worker health and safety programs, which are required by the Occupational Safety and Health Administration (OSHA), should also be considered. It is beyond the scope of this document to delineate exact requirements for each OSHA regulatory program. Instead, brief summaries of the major standards and information on current OSHA resource materials and contacts are provided in Appendix E. **Note that these are summaries only and should not be used for purposes of determining compliance.**

According to the National Safety Council, work-related injuries and deaths cost industry about \$120 billion per year. According to the U.S. Bureau of Labor Statistics (BLS), about 5% of injury and illness cases in all U.S. industries are caused by exposure to harmful substances or environments. Therefore, it is important to lower chemical exposures where feasible. It is also important to review chemicals used in printing operations to ensure that products are acceptable for employee health and safety and the environment.

It is important that workers take advantage of the information on chemicals in their workplace that is provided by material safety data sheets (MSDS). An explanation of the types of information on the MSDS is provided in the following section, followed by an MSDS form. EPA and OSHA both are striving to make sure that this data is accurate, useful and available to workers. For some facilities, MSDSs must also be submitted to the Local Emergency Planning Commission (LEPC), which uses them for emergency planning activities. The information on the MSDS is key to protecting workers, the community and emergency response personnel.

Why Do Environmental and Health & Safety Issues Go Hand-in Hand?

There are many examples of linkages between environmental and worker health & safety practices. Examples include:

- ☛ Appropriate handling practices and procedures for used supplies have a significant impact on worker and environmental protection.
- ☛ In an effort to reduce solvent emissions, many printers are investigating chemical substitution with materials that are less volatile (likely to evaporate). However, such an investigation should also consider the toxicity and potential for human health effects of potential replacement products or processes.
- ☛ Material data safety sheets are important for worker and environmental protection. An efficient system of receiving, reviewing, cataloging, retrieving, and updating these sheets is a cornerstone to a printing business's chemical hazard communication and control and environmental management programs.
- ☛ Hazard Communication, Hazardous Materials Handling, Personal Protective Equipment, and Respiratory Protection programs are some examples of where there is a crossover between environmental and occupational safety and health.

EPA and OSHA are both concerned with protecting human health and the environment. The distinction between them is that OSHA focuses on protecting workers whereas EPA focuses on protection of the community at large.

However, many of the control methods and programs are closely related. Both programs recognize that:

- ☛ People spend a significant amount of times at the workplace.
- ☛ Whenever chemicals contact the outside environment they also usually affect the workplace environment, frequently at higher levels of concentration, with greater potential for impacting human health.
- ☛ Some OSHA and EPA requirements are redundant, such as gathering chemical information, spill response, and training.
- ☛ Integrating worker and environmental protection can lead to more efficient and better programs.

What if I need further information?

If you don't understand the terms or recognize how they apply to the information here to your operation, you should seek training or assistance from the following:

- ☛ Federal OSHA Compliance Assistance Program
- ☛ State OSHA Compliance Assistance Program
- ☛ State Health Department, Bureau of Occupational Health
- ☛ Industry trade associations
- ☛ Industry labor unions, health & safety departments
- ☛ Occupational health clinics
- ☛ University or College-based occupational safety & health programs (usually in schools of Public Health or Engineering)
- ☛ Coalitions on Occupational Safety & Health (COSH groups)

OSHA publishes several publications that briefly describe their standards in plain language. Single copies are usually available free by calling the OSHA publications office at (202) 219-4667.

OSHA also maintains an extensive website at www.osha.gov. In addition to the full text of all OSHA standards, you can also find news releases, OSHA office directory, answers to frequently asked questions, OSHA directives, interpretation letters and other publications.

Material Safety Data Sheets

Material Safety Data Sheets (MSDSs) are required for each chemical product found in the workplace. They detail a product's properties, and must be kept on file and made available to employees. The information on these sheets includes identification of the hazardous chemicals within a product, any potential physical or health hazards, precautions for safe handling, emergency first aid procedures, required personal protective equipment, and more.

While MSDSs also provide basic environmental information, they should not be viewed as the sole source of this information. Suppliers and distributors are another good source of knowledge concerning the environmental impacts of chemical products in your facility. An MSDS form is provided on the following pages. Sample MSDSs can

be found at www.siri.org.

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Section I lists general information including the manufacturer's name, address, telephone number, and the chemical trade name of the product. The chemical family name and/or formula may be provided. Also, and most important, this section has the 24-hour Emergency Phone Number to be contacted for additional information about the product in the event of an emergency. This phone number can also be used to obtain environmental information about the chemical product.

Section II provides information on health hazards. Here you can find information on how the chemical may enter the human body, such as by inhalation or skin contact, referred to as routes of exposure, and whether or not it is considered a carcinogen. This section does not provide information on environmental hazards. However, suppliers often present environmental regulatory information in Section II (e.g., a chemical in the product is subject to Section 313 of SARA Title III).

Section III, Physical Hazards, lists reactivity data. It tells whether the material is stable in normal use, lists other incompatible materials, hazardous decomposition products (that may occur when a material is burned), and whether the material is subject to hazardous polymerization (whether it can react with itself in hazardous ways).

Section IV provides emergency first aid procedures.

Section V lists physical characteristics of the material. This includes boiling point, vapor pressure, vapor density (if vapor density is less than 1, vapors will rise; if greater than 1, vapors will sink and collect in low areas), solubility in water, specific gravity (if less than 1 the material will float on water; if greater than 1, it will not float), percent volatile by volume, evaporation rate, and appearance and odor. From the information on volatile organic compounds (VOCs), a facility can calculate emissions from equipment or the facility. This helps the facility determine the level of environmental regulations that apply to them.

Section VI lists any fire or explosion hazards. It includes the flash point (the temperature to which vapors of the material must be heated before a spark or flame will ignite them), the upper and lower flammable limits (the concentration of the material that will burn in air), and what to use to put out the fire. The flash point is one of the factors that is used to determine if a waste is hazardous.

Section VII lists special protection information. Included is suggested respiratory protection and advice on when gloves and/or eye protectors should be worn, and suggestions for ventilation requirements to be used with the material. This

section also details the procedures to be taken in case of a spill or other accidental release. Often, this section features the phrase, "dispose of in compliance with federal, state, or local regulations."

Additional sections describing hazardous ingredients of the product or regulatory information may be included. Information may be provided on the permissible exposure limits, or PEL, (also commonly referred to as Threshold Limit Values, or TLVs) of the chemical. The PEL is a limit, set by OSHA, at which an employee can be exposed to a chemical day after day with no adverse effects. Information on other regulations, such as SARA Title III or Department of Transportation restrictions, may be described.

MATERIAL SAFETY DATA SHEET

PRODUCT CODE: **Sheetfed Ink**

MSDS DATE: **March 28, 1997**

HMIS HAZARD RATING: Health = 0

Flammability = 0

Reactivity = 0

SECTION I General Information

Manufactured by: **ABC Ink Incorporated** Tel (212) 555-1212
100 Main Street Fax (212) 555-5555
New York, NY 12345

ABC Ink Inc. Product Identification:

Chemical Name: Ink #100

SECTION II Health Hazards

Acute: None
Eye Contact: None
Skin Contact: None
Ingestion: May be harmful if swallowed.
Inhalation: Minor respiratory tract irritation if dust generated
Carcinogenicity: Not listed as carcinogen or possible carcinogen by NTP, IARC, or OSHA

SECTION III Physical Hazards

Stability: ☐ Stable ☒ Unstable
Materials to Avoid (Incompatibility): Strong acids, strong alkali
Hazardous Decomposition Products: Oxides of carbon; various hydrocarbons, see Fire Data.
Hazardous Polymerization: ☒ May Occur ☐ Will Not Occur
Conditions to Avoid: Do not heat containers about 250 degrees F.

SECTION IV Emergency and First Aid Information

Eye Contact: N/A
Skin Contact: N/A
Ingestion: Provide emetic. Consult physician.
Inhalation: Remove from area. Consult physician if irritation occurs.

MATERIAL SAFETY DATA SHEET - ABC Ink Inc. (continued)

PRODUCT CODE: Ink #100

SECTION V Physical Data		
Boiling Point: >200 deg. C	Melting Point: <10 deg. C	Specific Gravity: 1.05 +/- 0.04
Vapor Pressure: N/A	Vapor Density: N/A	Solubility in Water: Negligible
Reactivity in Water: Negligible		Appearance and Odor: Faint oil odor, colored paste.

SECTION VI Fire and Explosion Data		
Flash Point: >100 deg. C	Flammable Limits: LEL = N/A	UEL = N/A
Autoignition Temperature: >300 deg. C	Extinguisher Media: CO2, Foam, Dry Chemical	
Special Fire Fighting Procedures: Wear self-contained breathing apparatus and full protective clothing		
Unusual Fire and Explosion Hazards: Possible generation of various hydrocarbons ranging from simple (e.g., methane, ethane) to toxic/irritating gases such as carbon monoxide, acrolein, ketones, and aldehydes.		

SECTION VII Protective Equipment/Control Measures	
Personnel -	
Respiratory Protection: N/A	
Eye Protection: Safety glasses	
Skin Protection: Not needed under normal usage. If heated, wear goggles, apron and gloves.	
Other Protective Measures: None required beyond standard safety practices as applied to any industrial chemical	
Handling and Storage -	
Precautions/Recommendations: Store below 150 deg. F. Wear safety glasses.	
Spill Procedures: Sweep up or scoop up into containers.	
Waste Disposal: Dispose of in accordance with all applicable regulations; non-hazardous under RCRA.	

SECTION VIII Regulatory Information	
HMIS Rating: Health = 0 Flammability = 0 Reactivity = 0	
*** Codes - Insignificant Risk = 0; Slight = 1; Moderate = 2; High = 3; Extreme Risk = 4	
SARA Title III, Section 313: This product contains no chemicals listed in 40 CFR 372.	
DOT Hazard Class: Non-hazardous/Not regulated.	

APPENDICES

Appendix A: PrintSTEP Air Levels: Materials Use Tables

Appendix B: PrintSTEP Air Levels: Emissions Calculations

Appendix C: List of Hazardous Air Pollutants (HAPS)

Appendix D: Templates, Forms and Example Letters

**Appendix E: Key Occupational Safety And Health (OSHA)
Regulations**

Appendix F: Glossary

Appendix A: PrintSTEP Air Levels: Materials Use Tables

Appendix A includes:

- ☛ An Example Materials Use Worksheet
- ☛ More information on the Materials Use Air Levels Tables

NOTE!! Printers who use **MORE THAN ONE** type of printing process at their facility **must use the Emissions Calculations method** in Appendix B to estimate emissions. In addition, printers who want credit for the reductions resulting from their pollution control devices or the use of low-VOC materials must use the Emissions Calculations method.

NOTE!! Printers must **use the Emissions Calculations method** instead of the Materials Use method **if 10% or more of the** facility's total Volatile Organic Compound (VOC) or Hazardous Air Pollutant (HAP) **emissions come from products not listed on the Materials Use Worksheet in Chapter 1.**

EXAMPLE Materials Use Worksheet

①	②	③	④	⑤	⑥	⑦
Printing Process	VOC-containing materials	Qty VOC-containing materials used in the last 12 mo.	Name of HAP present in material, if any	If the material has HAPs , copy Qty here once	✓ if HAP previously listed	Cumulative Sum of Each HAP
<u>Rotogravure with solvent-based inks</u>	inks	AB white ink 10,000 lbs	toluene	10,000 lbs		see ▼ below
		GJ-s blue 30x 8,000 lbs	none	----		
	dilution & cleaning solvent	AB solvent 1,000 lbs	toluene	1,000 lbs	✓	11,000 lbs
			glycol ethers			1,000 lbs
	adhesives & coatings	Super adhesive 2,000	n-hexane	2,000 lbs		2,000 lbs

VOC Total 21,000 lbs

 HAP Total 13,000 lbs

► **Volatile Organic Chemicals (VOCs) Example**

Now let's use the Worksheet totals to determine the PrintSTEP Air Level for the above facility in the St. Louis Region. **Note that the US EPA classifies the St. Louis Region as moderate ozone Non-Attainment area.** First, determine the Air Level based on use of VOC-containing materials. Using the Materials Use Air Level Table below, find the Level associated with the total VOC-containing material used, as recorded in the "VOC Total" box. Write that Air Level in Box 1. **It's 21,000 lbs in the above example.** Assume this example facility is a rotogravure printer using solvent-based inks, therefore use the second column in the table to find the Air Level.

Material Use Air Level Table for VOCs – St. Louis Region

Sheetfed Offset or Nonheatset Web Lithography, or Screen Printing	Heatset Web Offset Lithography (uncontrolled), or Flexography or <u>Rotogravure with solvent-based inks</u>	Flexography or Rotogravure with water-based inks*		Air Level
Less than 2,855 gals	Less than 20,000 lbs	Less than 80,000 lbs	→	Level 1
2,855 – 7,135 gals	20,000 – 50,000 lbs	80,000 – 200,000 lbs	→	Level 2
7,135 – 14,275 gals	50,000 – 100,000 lbs	200,000 – 400,000 lbs	→	Level 3
14,275 – 28,550 gals	100,000 – 200,000 lbs	400,000 – 800,000 lbs	→	Level 4
more than 28,550 gals	more than 200,000 lbs	more than 800,000 lbs	→	Level 5

* A water-based ink contains no more than 25% of the volatile fraction as VOCs.



This is the Air Level based on VOCs

1.

2

► Hazardous Air Pollutants (HAPs) Example

Now check the Air Level based on HAPs. Use the Material Use Air Level Table for HAPs below to find the Level associated with the quantity of HAP-containing material used. **This table specifies the same quantities of HAPs for each Air Level, regardless of the area's ozone Non-Attainment status.** There are two different numbers to check to determine the PrintSTEP Air Level based on HAPs:

\$ Compare the **TOTAL** HAP-containing materials, as recorded in the "HAP Total" box on the Worksheet, to the limits in the Table below. Find the PrintSTEP Air Level based on the TOTAL HAPs. **It's 13,000 lbs in the example, which is Air Level 1.**

\$ Then look over the sums for each individual HAP listed in Column 7 of the Worksheet. Compare the highest quantity of any **SINGLE** HAP used to the limits in the Table below. Find the Air Level based on a SINGLE HAP used. **The highest number in Column 7 is the example is 11,000 lbs, which is Air Level 3.**

Material Use Air Level Table for HAPs

Sheetfed Offset or Nonheatset Web Lithography, or Screen Printing		Air Level		Heatset Web Offset Lithography, or Flexography or <u>Rotogravure</u>	
TOTAL HAP-containing materials	Sum of materials containing any SINGLE HAP:			TOTAL HAP-containing materials	Sum of materials containing any SINGLE HAP:
less than 3,333 gals	less than 1,334 gals	→ Level 1	←	less than 25,000 lbs	less than 10,000 lbs
3,333 - 6,667 gals	1,334 - 2,667 gals	→ Level 3	←	25,000 - 50,000 lbs	10,000 - 20,000 lbs
more than 6,667 gals	more than 2,667 gals	→ Level 5	←	more than 50,000 lbs	more than 20,000 lbs

► Compare the two PrintSTEP Air Levels based on HAP-containing material. Enter the higher number in Box 2.

This is the Air Level based on HAPs

►► 2.

3

► Compare the numbers in Boxes 1 (for VOCs) & 2 (for HAPs) on the previous two pages. Write the higher number in Box 3 below:

This is the final PrintSTEP Air Level



3.

3

Check one:	The AIR LEVEL is:
<input type="checkbox"/>	Air Level 1
<input type="checkbox"/>	Air Level 2
<input checked="" type="checkbox"/>	Air Level 3
<input type="checkbox"/>	Air Level 4
<input type="checkbox"/>	Air Level 5

More information on PrintSTEP Materials Use method for determining Air Levels

NOTE!! Printers who use **MORE THAN ONE** type of printing process at their facility **must use the Emissions Calculations method** in Appendix B to estimate emissions. In addition, printers who want credit for the reductions resulting from their pollution control devices or the use of low-VOC materials must use the Emissions Calculations method.

NOTE!! Printers must **use the Emissions Calculations method** instead of the Materials Use method **if 10% or more of the** facility's total Volatile Organic Compound (VOC) or Hazardous Air Pollutant (HAP) **emissions come from products not listed on the Materials Use Worksheet in Chapter 1.**

Why was the Materials Use method developed?

The Materials Use method was developed to help you quickly and easily determine your facility's PrintSTEP Air Level. To complete your PrintSTEP application, you must determine your Air Level, either using the Materials Use method in Chapter 1 **or** the Emissions Calculations method in Appendix B. However, the Materials Use method gives the majority of small source printers a quick way to estimate their air emissions.

Both methods will help you estimate emissions, but the Materials Use method provides a handy shortcut for many printers who are small sources of emissions. They will probably qualify for Air Level 1 using the Material Use method.

The Materials Use method allows you to determine your facility's PrintSTEP Air Level **based on your facility's actual material usage for the last 12 months**. By assuming that a facility's air emissions are the result of the materials used by that facility, **the Materials Use method translates inventory that is consumed into air emissions**. This method provides a conservatively high estimate of your air emissions.

Who can use the Materials Use method?

The Materials Use method only works for those printers who use ONE type of printing process at their facility. The types of printing processes defined by PrintSTEP are:

- Sheetfed Lithography or Nonheatset Web Offset Lithography
- Heatset Web Offset Lithography
- Screen Printing
- Flexography or Rotogravure Printing Using Water-based or Solvent-based Inks

How does the Materials Use method provide a conservatively high estimate of emissions?

- The Materials Use method was developed using the most conservative assumptions to provide a safety margin. For example, the method assumes that 100% of press cleaners evaporate. In reality, we understand that much less than 100% of the wash actually evaporates.
- Conservative assumptions are used so you can be sure the Materials Use method will not *underestimate* your emissions, provided you do not increase production (e.g., increased hours of operation). If anything, it will *overestimate* your air emissions.
- When you use the Materials Use method, but find that you are a Level 1 facility (the lowest level), you can be certain you are in the right level. Even with overestimated emissions, you're in the level with the fewest regulatory requirements.
- The Materials Use method is a quick tool to estimate air emissions, but it does not account for factors such as low-VOC cleaners, or pollution control equipment.
- When you use the Materials Use method, but find you are in Level 2 or higher, you may want to consider using the Emissions Calculations method instead because the Materials Use method might be overestimating your emissions.
- Many printing facilities are small sources of air emissions that will be in Level 1 using the Materials Use method. This is why the Materials Use method can be really helpful; it gives the majority of printers a quick way to estimate their air emissions.

The Emissions Calculations method in Appendix B

The Emissions Calculations method allows you to account for factors that reduce your air emissions and are not accounted for in the conservative assumptions used in the Materials Use method. If you are using pollution control equipment or low-VOC cleaners, inks, or other materials you may find you are in a lower level using the Emissions Calculations method. See the low VOC ink example on the next page.

Using Emissions Calculations Method to Account for Low VOC Inks

A flexographic printer located in the St. Louis Region uses 500,000 pounds of water-based inks per year. Using the Materials Use method, this printer is in Air Level 4. The Materials Use method makes the conservative estimate that water-based inks have a VOC content of 25%. In reality, this printer's inks only have a 5% VOC content. Because of this difference in actual and assumed VOC content, the Materials Use method overestimates this printer's emissions. Using the Emissions Calculations method, however, the printer can get full credit for their low VOC ink. The Emissions Calculations method shows that the printer is in Level 3 for air emissions, and with the lower level come fewer regulatory requirements.

What assumptions were made in developing the Materials Use method?

1. The gallons of HAP-containing materials used (for example, 2,667 gallons [also 20,000 pounds] or 6,667 gallons [also 50,000 pounds]) are based upon 2-butoxyethanol as the representative HAP, which weighs 7.5 pounds per gallon, all of which is evaporated.
2. "Cleaning solvent" density is assumed to be 7.0 lbs/gallon, 100% VOC, and all of which is evaporated.
3. "Fountain solution additives" include isopropyl alcohol, n-propyl alcohol, n-butanol, and alcohol substitutes. The weight of isopropyl alcohol is 6.6 lbs/gallon, but for the table is assumed to be 7.0 lbs/gallon and 100% VOC.
4. The water-based inks, water-based coatings and water-based adhesives are assumed to contain no more than 25% of the volatile fraction as VOC and all is assumed to evaporate. (*Control Techniques Guidelines for Graphic Arts--Rotogravure and Flexography*, EPA-450/2-78-033).
5. "Adhesives" and "Coatings" for solvent-based operations are assumed to weigh 7.0 lbs/gallon, 100% VOC, and all of which is evaporated.

Appendix B: PrintSTEP Air Levels: Emissions Calculations

NOTE!! Printers who use **MORE THAN ONE** type of printing process at their facility **must use the Emissions Calculations method** in Appendix B to estimate emissions. In addition, printers who want credit for the reductions resulting from their pollution control devices or the use of low-VOC materials must use the Emissions Calculations method.

NOTE!! Printers must **use the Emissions Calculations method** instead of the Materials Use method **if 10% or more of the** facility's total Volatile Organic Compound (VOC) or Hazardous Air Pollutant (HAP) **emissions come from products not listed on the Materials Use Worksheet in Chapter 1.**

Overview

The Emissions Calculations method allows you to account for efforts you have taken to reduce the amount of air emissions from your facility in determining your PrintSTEP Air Level. This may include use of low-VOC and non-HAP products, retention factors for lithography, capture efficiency and destruction removal efficiency figures. For you to take credit for these changes, you must use the Emissions Calculations Method.

If you have multiple printing processes on site (e.g., a sheetfed non-heatset offset press and a heatset web offset press), you will not be able to use the Materials Use method in Chapter 1. You must determine your emissions using the Emissions Calculations method instead. Instructions for determining your PrintSTEP Level for air using the Emissions Calculations method follow.

1. GATHER BACKGROUND INFORMATION

Review the "Process Tables" on the following pages and find the one(s) that describes your printing process(es). Look at the list of "VOC-containing Materials" in the first column of the appropriate Process Table(s). For each of these materials gather the following:

1. usage records (e.g., purchase, inventory records) of these materials for the past 12 months;
2. product data sheets, MSDS sheets, and information from suppliers for these materials; and
3. Destruction Removal Efficiencies and Capture Efficiencies of your pollution control equipment.

NOTE!! You must check your records to see if you use any type of materials in your printing process other than those listed in the "VOC-containing Materials" column. If these "other" materials constitute more than 10% of the VOCs or HAPs used in your facility, you must list these in the "Other Materials" row.

2. COMPLETE THE APPLICABLE PROCESS TABLES

- If you have a **controlled heatset web offset lithographic press**, you will have to fill in the shaded cells in the Process Table with the pollution control equipment's Destruction Removal Efficiency (DRE). Also, complete the calculations according to the column headers in the Process Table(s).
- If you have a **controlled flexographic or rotogravure press with solvent-based ink**, you will need to fill in the shaded cells in the Process Table with the Destruction Removal Efficiency (DRE) and Capture Efficiency figures for your pollution control devices. Also, complete the calculations according to the column headers in the Process Table(s).
- For all other types of presses, the Process Tables are complete:

Process Table1**HEATSET WEB OFFSET LITHOGRAPHY with control devices**

Column A		Column B	
VOC-CONTAINING MATERIALS	VOC EMISSIONS FACTOR ¹ (before controls)	DESTRUCTION REMOVAL EFFICIENCY (DRE) of control device Fill in shaded cells	MULTIPLIER for emissions after controls Fill in shaded cells using: 1 - DRE
Ink ² (lbs)	0.80 (due to 20% retention factor)		
Cleaning Solvent (gal)	0.50 ³ (due to 50% retention factor)	0	1
Automatic Blanket Wash (thru a control device) (gal)	0.40 ⁴		
Automatic Blanket Wash (NOT thru a control device) (gal)	0.60	0	1
Fountain Solution Concentrate/Additive (gal) (thru a control device)	0.70 ⁵		
Fountain Solution Concentrate/Additive (gal) (NOT thru a control device)	0.30	0	1
Adhesives and coatings (gal) (thru a control device)			
Adhesives and coatings (gal)		0	1

¹VOC Emissions factors (retention, and dryer carryover) are from the 1993 EPA draft CTG for Offset Lithography and the 1994 ACT for Offset Lithography.

²Ink includes lithographic varnishes and additives.

³ 50% retention in shop towels can be used only if soiled towels are kept in a closed container and the vapor pressure of the cleaning solvent is less than 10mmHg at 20 degrees C. All others use 1.0.

⁴ Applies only if the wash has a vapor pressure less than 10mmHg at 20 degrees C.

⁵ For alcohol substitutes only, use 0.70 reflecting 70% dryer carryover. (Carryover values other than 70% may substitute the percent carryover divided by 100.)

(NOT thru a control device)			
Other VOC-containing Materials			

Process Table 2
HEATSET WEB OFFSET LITHOGRAPHY without control devices

	Column A	Column B
VOC-CONTAINING MATERIALS	VOC EMISSIONS FACTOR¹ (before controls)	MULTIPLIER for uncontrolled processes
Ink ¹	0.80	1
Cleaning Solvent (gal)	0.50 ²	1
Automatic Blanket Wash (gal)	1	1
Fountain Solution Concentrate/Additive (gal)	1	1
Adhesives and Coating	1	1
Other VOC-containing Materials	1	1

Process Table 3
NON-HEATSET WEB or SHEETFED OFFSET LITHOGRAPHY

	Column A	Column B
VOC-CONTAINING MATERIALS	VOC EMISSIONS FACTOR¹ (before controls)	MULTIPLIER for uncontrolled processes
Ink (lbs) ^{1, 6}	0.05	1
Cleaning Solvent (gal)	0.50 ²	1
Automatic Blanket Wash (gal)	1	1
Fountain Solution Concentrate/Additive (gal)	1	1
Adhesives and Coatings	1	1
Other VOC-containing Materials	1	1

⁶ Does not apply to UV-cured material

Process Table 4

SCREEN PRINTING, FLEXOGRAPHY or ROTOGRAVURE: WATER-BASED INKS
FLEXOGRAPHY or ROTOGRAVURE without control devices: SOLVENT-BASED INKS

Column A		Column B
VOC-CONTAINING MATERIALS	VOC EMISSIONS FACTOR (before controls)	MULTIPLIER for uncontrolled processes
Ink (gal)	1	1
Ink Dilution Solvent (lbs)	1	1
Coating (gal)	1	1
Adhesive (gal)	1	1
Cleaning Solvent (gal)	1	1
Other VOC-containing Materials	1	1

Process Table 5

CONTROLLED FLEXOGRAPHY or ROTOGRAVURE: SOLVENT-BASED INKS

Column A			Column B	
VOC-CONTAINING MATERIALS	VOC EMISSIONS FACTOR (before controls)	CAPTURE EFFICIENCY (CE) of control device Fill in column.	DESTRUCTION REMOVAL EFFICIENCY (DRE) of control device Fill in column.	MULTIPLIER for emissions after controls Calculate shaded cells using following equation: 1 - (CE x DRE)
Ink (gal)	1			
Ink Dilution Solvent (gal)	1			
Coating (gal)	1			
Adhesive (gal)	1			
Cleaning Solvent (gal)	1			
Other VOC- containing Materials	1			

3. **FILL IN THE EMISSIONS WORKSHEET**

- You must fill out the Emissions Worksheet going from Column 1 to Column 11, then completing each row before going on to the next. **THIS IS VERY IMPORTANT.**
- A sample material is listed to clarify the directions below.

COLUMN 1

- Your Process Table lists the product categories whose VOC and HAP content will determine your PrintSTEP Air Level -- for example, inks, fountain solutions, cleaning solvent, and adhesives and coatings for lithography.
- Start with the first product listed in the Process Table(s) 1 through 5 for your facility on the previous three pages.
- Write the name of product in Column 1.
- Fill in the row for **ONE PRODUCT AT A TIME**, completing an entire row **BEFORE** going to the next.
- If you use more than one printing process, complete the table for one process at a time, using the appropriate Process Tables as necessary.

COLUMN 2

- Fill in Column 2 with the material's brand name, as given on your product data sheets or MSDSs.

COLUMN 3

- If the amount of material used is in gallons, convert to pounds by multiplying by the density (lbs/gal) of the product.
- Using your purchasing and inventory records, write down the pounds of product used during the past 12 months.

COLUMN 4

- "Column A" in your Process Table gives the emission factors for each material you listed.
- Copy the appropriate data in "Column A" from your Process Table, into Column 4 of the Emissions Worksheet.

COLUMN 5

- "Column B" in your Process Table gives the pollution control device multiplier for each product you listed in Column 1. This number will be a '1' for uncontrolled processes.
- Copy the appropriate data in "Column B" from your Process Table, into Column 5 of the Emissions Worksheet.

COLUMN 6

- Calculate your subtotal using the following equation:
$$\text{Column 6} = (\text{Column 3}) \times (\text{Column 4}) \times (\text{Column 5})$$

COLUMNS 7 and 8

- Find what HAPs are in each material on the MSDS or product data sheet. Verify with your supplier. Values used must be consistent with values that would be obtained with EPA Method 311 for HAPs.
- List the HAPs in Column 7, using multiple rows if there are multiple HAPs in one material.
- List the corresponding HAP contents in Column 8. HAP content must be entered into Column 8 as a weight fraction. This is the percentage by weight divided by 100 to get the weight fraction.

COLUMN 9

- Calculate your HAP emissions by using the following equation:
$$\text{Column 9} = (\text{Column 6}) \times (\text{Column 8})$$
- Make sure your HAP emissions figure is in pounds.

COLUMN 10

- Find the VOC content of each material on the MSDS or product data sheets. Verify with your supplier. Values used must be consistent with values that would be obtained with EPA Method 24 for VOCs, or Method 24-A for Rotogravure inks.
- Write this down in Column 10. VOC content must be entered into Column 10 as a fraction. This is the percentage by weight divided by 100 to get the weight fraction.
- Note that any given material may need several rows if it contains several different kinds of HAPs, but you do not need to list different VOCs within a material on separate lines. You just need to list the total VOC content of every material.

COLUMN 11

- Calculate your VOC emissions by using the following equation:
$$\text{Column 11} = (\text{Column 6}) \times (\text{Column 10})$$
- Make sure your VOC emissions figure is in pounds.

WRAPPING UP

- When you finish filling out the table with all of your materials' individual VOC and HAP emissions, calculate the totals in the boxes at the bottom of Columns 9 and 11.
- Add up all of the entries in each column to find the grand total.

Emissions Worksheet: page 1

(1)

(2)

(3)

(4)

(5)

(6)

[illegible]

Emissions Worksheet Page 2

(7)

(8)

(9)

(10)

(11)

HAPs	HAP content (weight fraction)	HAP emissions Col. (6)x(8)	VOC Content (weight fraction)	VOC emissions Col. (6)x(10)
toluene	0.05	40	0.50	400
xylene	0.15	120	-----	-----
Total HAP emissions:			Total VOC emissions:	

4. DETERMINE YOUR PrintSTEP AIR LEVEL BASED ON VOC EMISSIONS

- Look at the total pounds of VOC emissions that you calculated at the bottom of Column 11 of your Emissions Worksheet.
- GO to the Emissions Worksheet Air Level Table on page B-10.
- Find the column for your facility's location.
- **Within that column**, find the range into which your total VOC Emission (from the Emissions Worksheet Air Level Table) falls.
- Follow this row across to the right to the "PrintSTEP Level" column. Circle the PrintSTEP Air Level you find.
- Write that PrintSTEP Air Level: _____

5. DETERMINE YOUR PrintSTEP AIR LEVEL BASED ON HAPs

TOTAL HAPs

- Write your total pounds of HAP emissions (from the bottom of Column 9 of your Emissions Worksheet) here: _____
- Using the Emissions Worksheet Air Level Table, look at the column farthest to the right labeled "HAPs".
- **Within that column**, find the range into which your total HAP Emissions falls (from Column 9 of your Emissions Worksheet).
- Follow this row left, to the "PrintSTEP Air Level" column, and circle the PrintSTEP Air Level you find.
- Write that PrintSTEP Air Level here: _____
- Look at your individual HAP emissions.
-

INDIVIDUAL HAPs

- Be sure to add together the HAP emissions figures for any single HAP that occurs in multiple materials.
- For instance, if two of your inks and one of your cleaning solvents contain toluene, then add up these three toluene emissions that you calculated in Column 9, to find your total toluene emissions.
 - Write down the total pounds of the single HAP with the highest amount of emissions (it may be from several different materials combined or from one material) here: _____
 - Look in the "HAPs" column on the Emissions Worksheet Air Level Table to find the range where your highest HAP emission falls.
 - Follow this row reading left, to the "PrintSTEP Air Level" column, and circle the PrintSTEP Air Level you find.
 - Write down the PrintSTEP Air Level you find: _____

6. DETERMINE YOUR FINAL PrintSTEP AIR LEVEL

- Compare the Levels circled in Parts 4 and 5 above.
- The highest PrintSTEP Air Level is your final Level.

- Write your final PrintSTEP Air Level here: _____

Appendix C: List of Hazardous Air Pollutants (HAPS)

The Hazardous Air Pollutants from the 1990 Clean Air Act Amendments are listed below. **Those that may be used in some printing processes are in bold type.**

Acetaldehyde	1,2-Dibromo-3-chloropropane
Acetamide	Dibutylphthalate
Acetonitrile	1,4-Dichlorobenzene(p)
Acetophenone	3,3-Dichlorobenzidine
2-Acetylaminofluorene	Dichloroethyl ether (Bis(2-chloroethyl)ether)
Acrolein	1,3-Dichloropropene
Acrylamide	Dichlorvos
Acrylic Acid	Diethanolamine
Acrylonitrile	N,N-diethyl aniline (N,N-Dimethylaniline)
Allyl chloride	Diethyl sulfate
4-Aminobiphenyl	3,3-Dimethoxybenzidine
Aniline	Dimethyl aminoazobenzene
o-Anisidine	3,3'-Dimethyl benzidine
Asbestos	Dimethyl carbamoyl chloride
Benzene (including benzene from gasoline)	Dimethyl formamide
Benzidine	1,1-Dimethyl hydrazine
Benzotrichloride	Dimethyl phthalate
Benzyl chloride	Dimethyl sulfate
Biphenyl	4,6-Dinitro-o-cresol and salts
Bis (2-ethylhexyl) phthalate (DEHP)	2,4-Dinitrophenol
Bis (chloromethyl) ether	2,4-Dinitrotoluene
Bromoform	1,4-Dioxane (1,4-Diethyleneoxide)
1,3-Butadiene	1,2-Diphenylhydrazine
Calcium cyanamide	Epichlorohydrin (1-Chloro-2,3-epoxypropane)
Captan	1,2-Epoxybutane
Carbaryl	Ethyl acrylate
Carbon disulfide	Ethyl benzene
Carbon tetrachloride	Ethyl carbamate (Urethane)
Carbonyl sulfide	Ethyl chloride (Chloroethane)
Catechol	Ethylene dibromide (Dibromoethane)
Chloramben	Ethylene dichloride (1,2-Dichloroethane)
Chlordane	Ethylene glycol
Chlorine	Ethylene imine (Aziridine)
Chloroacetic acid	Ethylene oxide
2-Chloroacetophenone	Ethylene thiourea
Chlorobenzene	Ethylidene dichloride (1,1-Dichloroethane)
Chlorobenzilate	Formaldehyde
Chloroform	Heptachlor
Chloromethyl methyl ether	Hexachlorobenzene
Chloroprene	Hexachlorobutadiene
Cresols/cresylic acid (isomers and mixture)	Hexachlorocyclopentadiene
o-Cresol	Hexachloroethane
m-Cresol	Hexamethylene-1,6-diisocyanate
p-Cresol	Hexamethylphosphoramide
Cumene	Hexane
2,4-D, salts and esters	Hydrazine
DDE	Hydrochloric acid
Diazomethane	Hydrogen fluoride (Hydrofluoric acid)
Dibenzofurans	Hydroquinone
Isophorone	Lindane (all isomers)
	Maleic anhydride

Methanol

Methoxychlor

Methyl bromide (Bromomethane)

Methyl chloride (Chloromethane)

Methyl chloroform (1,1,1-Trichloroethane)

Methyl ethyl ketone (2-Butanone)

Methyl hydrazine

Methyl iodide (Iodomethane)

Methyl isobutyl ketone (Hexone)

Methyl isocyanate

Methyl methacrylate

Methyl tert butyl ether

4,4'-Methylene bis (2-Chloroaniline)

Methylene chloride (Dichloromethane)

Methylene diphenyl diisocyanate (MDI)

4,4-Methylenedianiline

Naphthalene

Nitrobenzene

4-Nitrobiphenyl

4-Nitrophenol

2-Nitropropane

N-Nitroso-N-methylurea

N-Nitrosodimethylamine

N-Nitrosomorpholine

Parathion

Pentachloronitrobenzene (Quintobenzene)

Pentachlorophenol

Phenol

p-Phenylenediamine

Phosgene

Phosphine

Phosphorus

Phthalic anhydride

Polychlorinated biphenyls (Aroclors)

1,3-Propane sultone

Beta-propiolactone

Propionaldehyde

Propoxur (Baygon)

Propylene dichloride (1,2-Dichloropropane)

Propylene oxide

1,2-Propylenimine (2-Methyl aziridine)

Quinoline

Quinone

Styrene

Styrene oxide

2,3,7,8-Tetrachlorodibenzo-p-dioxin

1,1,2,2-Tetrachloroethane

Tetrachloroethylene (Perchloroethylene)

Titanium tetrachloride

Toluene

2,4-Toluene diamine

2,4-Toluene diisocyanate

o-Toluidine

Toxaphene (Chlorinated camphene)

1,2,4-Trichlorobenzene

1,1,2-Trichloroethane**Trichloroethylene**

2,4,5-Trichlorophenol

2,4,6-Trichlorophenol

Triethylamine

Trifluralin

2,2,4-Trimethylpentane

Vinyl acetate

Vinyl bromide

Vinyl chloride

Vinylidene chloride (1,1-Dichloroethylene)

Xylenes (isomers and mixture)

o-Xylenes

m-Xylenes

p-Xylenes

Antimony compounds

Arsenic compounds (inorganic, including arsine)

Beryllium compounds

Cadmium compounds**Chromium compounds****Cobalt compounds**

Coke oven emissions

Cyanide compounds

Glycol ethers**Lead compounds**

Manganese compounds

Mercury compounds

Fine mineral fibers

Nickel compounds

Polycyclic organic matter

Radionuclides (including radon)

Selenium compounds

Appendix D:

Templates

Forms
and
Example Letters

For PrintSTEP volunteers to use in the application process.

Form 1: PrintSTEP Application

Form 2: Example Letter to a Local Elected Official

Form 3: Example Letter to the Administrator of a Specific Population Facility

Appendix E: Key Occupational Safety And Health (OSHA) Regulations

The following narratives outline some of the key occupational safety and health regulations that are typically applied to printing operations. The narratives are only a guide and don't cover all Occupational Safety and Health Administration (OSHA) standards, which may be encountered in printing facilities. In particular, there are many safety measures that don't directly link to environmental protection, but are critically important to employee well-being such as "lock out tag out", "fire and life safety", "noise", and "machine guarding". Therefore, you should consult with the contacts listed in Chapter 6 and the OSHA standards for a complete OSHA compliance program. Furthermore, there may be new standards or changes to existing standards that have occurred since the printing of this publication. The OSHA Act, Duties, Section 5 (a)(2), mandates that employers, "shall comply with occupational safety and health standards promulgated under this Act". Therefore, it is the responsibility of each printer to stay abreast of new or modified standards.

Chemical Hazard Communication (29 CFR 1910.1200)

OSHA's Hazard Communication Standard, commonly referred to as the "right-to-know" standard, establishes uniform requirements to make sure that the hazards of all chemicals produced or used in the workplace are evaluated, and that this information is transmitted to affected employers and exposed employees.

Employers must develop, implement and maintain at the workplace, a written hazard communication program that includes provisions for container labeling, collection and availability of material safety data sheets (MSDSs), and an employee training program. The program must also contain a list of hazardous chemicals in each work area.

The employer must obtain a (MSDS) for each hazardous chemical brought into the workplace. The chemical manufacturer or distributor usually provides this at the time of the initial shipment. If the MSDS is not provided, the employer must write to the supplier to obtain one. Copies of the MSDS must be readily accessible to employees. If contents are transferred to smaller containers, these containers must be marked with the identity of the chemical and its hazards.

Employers must establish a training and information program for employees exposed to hazardous chemicals in their work area at the time of initial assignment and whenever a new hazard is introduced into their work area.

The employee should be informed on elements of the hazard communication standard and how they are being implemented in their work area. Workers must be trained about the hazards of the chemicals in their work area, how to read and interpret information on labels and the MSDS, how to protect themselves from the hazards. They also must learn of specific procedures put into effect by the employer to provide protection such as engineering controls, work practices, and the use of personal protective equipment, and how to detect the presence of a hazardous chemical to which they may be exposed.

SUBPART Z C TOXIC AND HAZARDOUS SUBSTANCES

Air Contaminants (29 CFR 1910.1000)

This section contains a listing of over 400 chemicals that are regulated by OSHA. An employee's exposure to any substance listed in this section shall be limited in accordance with the requirements. OSHA has established permissible exposure limits (PELs) which describe exposure concentrations that may not be exceeded. The limits are based on a normal 8-hour workday and 40-hour workweek, to which nearly all workers may be repeatedly exposed without adverse effect. These limits are expressed in parts per million (PPM) which are the number of parts of contaminant per million parts of air (just like percent (%) is the number of parts per hundred). Gases and vapors are usually expressed as milligrams per cubic meter. This represents the number of milligrams of contaminant per cubic meter of air.

Short Term Exposure Limits (STELs) are 15-minute concentrations that may not be exceeded. In addition, OSHA uses special computation formulas for calculating employee exposure to more than one substance or mixtures of substances for which 8-hour time weighted averages are listed, in order to determine whether an employee is exposed over the regulatory limit.

To achieve compliance with this section employers must reduce contaminant levels below regulatory limits using administrative or engineering controls. When such controls are not feasible to achieve full compliance, protective equipment or any other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed. Any equipment and/or technical measures used for this purpose must be approved for each particular use by a competent industrial hygienist or other technically qualified person.

Flammable and combustion liquids (29 CFR 1910.106)

This section applies to the handling, storage, and use of flammable and combustible liquids. These requirements are intended to prevent fires and explosions. The flashpoint of a chemical is the lowest temperature, at which there are enough vapors to make a fire if there is something to ignite it like a match or spark. Flammable liquids have a flash point below 100 degrees Fahrenheit and combustible liquids have a flash point at or above 100 degrees Fahrenheit. Flammable liquids are high fire risks. Combustible liquids are moderate fire risks. Information about the flashpoint of a chemical can be found on the MSDS.

<p>Example: Toluene has a flashpoint of 40° F. At room temperature (about 68° F) toluene would give off enough vapors to light from a match held near the surface of the liquid.</p>

In printing plants the use and handling of flammable or combustible liquids is usually only incidental to the principal business. Flammable or combustible liquids must be stored in tanks or closed containers. OSHA requires that the quantity of liquid that may be located outside of an inside storage room, storage cabinet in a building, or in any one fire area of the building must not exceed specific limits.

There are special requirements for construction and ventilation of inside storage rooms and portable containers that are used for flammable liquids. Combustible waste material and residues in a building or unit operating area must be kept to a minimum stored in covered metal receptacles and disposed of daily.

Respiratory Protection (29 CFR 1910.134)

Respirators are the least desirable means of protecting workers from contaminated workplace air. They are usually uncomfortable, may interfere with job performance, and they do nothing to reduce the hazard, they simply reduce exposure. When feasible, prevention of contamination of work site air should be accomplished by engineering control measures such as: substituting less toxic materials; enclosing or confining the operation; or ventilation.

When respirators are necessary for health protection because contaminant levels exceed OSHA standards, OSHA requires specific procedures. Employers are responsible for establishing an effective written respirator program and employees are responsible for wearing respirators and complying with the program.

Choosing the right respirator involves several steps: determining the hazard and its concentration, choosing equipment that is certified for the function, and ensuring that the device is performing as intended. Chemical or physical properties of the contaminant, as well as the toxicity and concentration of the hazardous material and the amount of oxygen present, must be considered in selecting the proper respirators. For example different types of respirators are used for protection from particular gases, dusts, or oxygen deficient environments.

Any respirator program should include training of all participants, especially the respirator users. Employees must be aware that the equipment does not eliminate the hazard. To reduce the possibility of failure, equipment must be properly used and maintained in a clean and serviceable condition. The training, conducted by a competent person, must include instructions on respirator fit and how to check the facepiece-to-face seal. Usually respirator manufacturers will provide fit testing and fit checking training. These steps are necessary to select the proper sized respirator for individual workers and to teach them how to wear them and care for them.

Access to Employee Exposure and Medical Records (29 CFR 1910.1020)

This standard requires that employers provide employees, their designated representatives and OSHA, access to employer-maintained exposure and medical records. Access to these records may enable workers to determine patterns of health impairment and disease and to establish casual relationships between disease and exposure to particular hazards. Access to these records also should result in a decreased incidence of occupational exposure by aiding in designing and implementing new control measures.

Employee exposure record means a record containing any of the following kinds of information:

- (i) Environmental (workplace) monitoring or measuring (including methodologies) of a toxic substance or harmful physical agent;
- (ii) Biological monitoring results which directly assess the absorption of a toxic substance or harmful physical agent by body systems (e.g., the level of a chemical in the blood, urine, breath, hair, fingernails, etc);

- (iii) Material safety data sheets indicating that the material may pose a hazard to human health; or
- (iv) In the absence of the above, a chemical inventory or any other record which reveals where and when used and the identity (e.g., chemical, common, or trade name) of a toxic substance or harmful physical agent.

Employee medical record means a record concerning the health status of an employee, which is made or maintained by a physician, nurse, or other health care personnel or technician.

At the time of initial employment and at least annually thereafter, employees must be told of the existence, location, and availability of the medical and exposure records. The employer must also inform each employee of his or her rights under the access standard and make copies of the standard available. Employees also must be told who is responsible for maintaining and providing access to records.

Retention of DOT labels (29 CFR 1910.1201)

Any package of hazardous materials required to be labeled by the Department of Transportation must have its labels retained until the packaging is cleaned and vapors purged from the container. Markings must be maintained in a manner that ensures they are readily visible.

Personal Protective Equipment (29 CFR 1910.132, 133, 135 & 136)

The standard requires employers to conduct a hazard assessment, training, and to provide necessary personal protective equipment (PPE) for head, eye and face, ear, torso, and arm and hand protection.

PPE should not be used as a substitute for engineering, work practice, and/or administrative controls. PPE should be used in conjunction with these controls to provide for employee safety and health in the workplace. PPE includes all clothing and other work accessories designed to create a barrier against workplace hazards. The basic element of any management program for PPE should be an in depth evaluation of the equipment needed to protect against hazards at the workplace.

Employees must be aware that the equipment does not eliminate the hazard. If the equipment fails, exposure will occur. To reduce the possibility of failure, equipment must be properly fitted and maintained in a clean and serviceable condition.

Employee Emergency Plans and Fire Prevention Plans (29 CFR 1910.38)

Employers should prepare their workers to handle emergencies before they arise. **Firms with more than 10 employees must have a written emergency action plan; smaller companies may communicate their plans orally. Management should provide an emergency alarm system.**

Management should review plans with employees initially and whenever the plan or employees responsibilities under it, change. Plans should be re-evaluated and updated periodically. Emergency procedures, including the handling of any toxic chemicals, should include:

- Escape procedures and escape route assignments.
- Special procedures for employees who perform or shut down critical plant operations.
- A system to account for all employees after evacuation.
- Rescue and medical duties for employees who perform them.
- Means for reporting fires and other emergencies.
- Contacts for information about the plan including off-duty numbers.

Members of emergency response teams should be thoroughly trained for potential emergencies and be physically capable of carrying out their duties; know about toxic hazards in the workplace and be able to judge when to evacuate personnel or depend on outside help (e.g. when a fire is too large for them to handle).

Every employee needs to know details of the emergency action plan, including evacuation plans, alarm systems, reporting procedures for personnel, shutdown procedures, and types of potential emergencies. Drills should be held at random intervals, at least annually, and include, if possible, outside police and fire authorities.

Training must be conducted initially, when new employees are hired, and at least annually. Additional training is needed when new equipment, materials, or processes are introduced, when procedures have been updated or revised, or when exercises show that employee performance is inadequate.

Employers not near an infirmary, clinic, or hospital should have someone on-site trained in first aid, have medical personnel readily available for advice and consultation, and develop written emergency medical procedures. It is essential that first aid supplies are available to the trained medical personnel and that emergency phone numbers are placed in conspicuous places near or on telephones, and prearranged ambulance services for any emergency are available.

More detailed information on workplace emergencies is provided in "How to Prepare for Workplace Emergencies" (OSHA 3088)

Employee Roles in Emergency Response (29 CFR 1910.120(q))

Training for the "first responder awareness level" enables employees who are likely to witness releases of hazardous substances to recognize emergencies and notify authorities. The training class would cover an understanding of what their role is in the employer's Emergency Response Plan, who to contact in the event of an uncontrolled release and provides a basic understanding of hazardous materials and risks associated with them.

Employees with this limited training must not attempt any actions themselves to control or clean up the release. The "first responder operations level" may take defensive action only (such as diking or placing absorbent socks to prevent the spill from spreading) without trying to stop the release. The training course would cover basic hazard and risk assessment techniques, the selection and use of personal protective equipment, basic knowledge of control, containment and/or confinement operations, and basic decontamination procedures. If you are to actively fight a spill, additional training is required. Employees must meet all of the training requirements in 29 CFR 1910.120(q)(6) if they will take charge of the incident or will be in areas where there is a safety and health threat.